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PROCEEDINGS
OF THE
CONNECTICUT
STATE MEDICAL SOCIETY

1908

116th ANNUAL CONVENTION

HELD AT

NEW HAVEN, MAY 27th and 28th

EDITOR

WALTER R. STEINER

ASSISTANTS

FREDERICK B. WILLARD

CHARLES J. BARTLETT

PUBLISHED BY THE SOCIETY

The Connecticut State Medical Society does not hold itself responsible for the opinions contained in any article, unless such opinions are indorsed by special vote. All communications intended for the Connecticut State Medical Society should be addressed to Walter R. Steiner, M.D., Hartford, Conn.

The next annual meeting of the Connecticut State Medical Society will be held in Hartford, May 26th and 27th, 1909.

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Warren Russell Davis of Voluntown, by George H. Jennings of Jewett City,

William Jedediah Ford of Washington, by Charles I. Page of Litchfield,

Arthur D. Hayes of Hartford, by Charles E. Taft of Hartford,

George James Holmes of New Britain, by Herman Strosser of New Britain,

Julian LaPierre of Norwich, by William Witter of Norwich,

Edward Payson Nichols of Killingworth, by Miner C. Hazen of Haddam,

William J. O'Neil of New London, by Abiel W. Nelson of New London,

George Rubens Shepherd of Hartford, by Frederick T. Simpson of Hartford,

John Alexander Wade of Danbury, by Harris F. Brownlee of Danbury,

Members of Society.

Honorary Members,

Active Members by Counties, with Post Office Address,

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Alphabetical List of Living Members with Degrees, and Date of Graduation,

OFFICERS OF THE SOCIETY.

1908-1909.

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WALTER L. BARBER, Waterbury.

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WALTER R. STEINER, Hartford.

Treasurer.

JOSEPH H. TOWNSEND, New Haven.

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Allen R. Dicfendorf.	Frank K. Hallock.
The President.	

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Frederick T. Simpson.	D. Chester Brown.
J. Reed Topping.	

COMMITTEE ON NATIONAL LEGISLATION.

William L. Higgins.

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DELEGATES TO AMERICAN MEDICAL ASSOCIATION.

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 Everett J. McKnight, Hartford.

DELEGATES TO STATE ASSOCIATIONS.

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NEW HAMPSHIRE.

Frank Tiffany, Stamford. J. C. Kendall, Norfolk.

VERMONT.

T. R. Parker, Willimantic. T. F. Rockwell, Rockville.

MASSACHUSETTS.

Oliver C. Smith, Hartford. Charles J. Bartlett, New Haven.

RHODE ISLAND.

A. E. Barber, Bethel. C. E. Brayton, Stonington.

NEW YORK.

David R. Lyman, Wallingford. L. W. Bacon, New Haven.

NEW JERSEY.

R. S. Goodwin, Thomaston. R. A. McDonnell, New Haven.

PENNSYLVANIA.

E. P. Swasey, New Britain. Henry Blodget, Bridgeport.

HOUSE OF DELEGATES.

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NEW HAVEN COUNTY.

CHARLES J. FOOTE.

CHARLES S. RODMAN (councilor-elect).

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EDWARD P. BREWER.

FAIRFIELD COUNTY.

GOULD A. SHELTON (re-elected).

WINDHAM COUNTY.

FRANK E. GUILD.

LITCHFIELD COUNTY.

EDWARD H. WELCH (re-elected).

MIDDLESEX COUNTY.

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TOLLAND COUNTY.

CYRUS B. NEWTON.

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Charles J. Bartlett.

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PROCEEDINGS.

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FAIRFIELD COUNTY.

D. Chester Brown. George H. Noxon.
William S. Randall. Frank W. Stevens.
John W. Wright.

WINDHAM COUNTY.

Theodore R. Parker. Rienzi Robinson.

LITCHFIELD COUNTY.

Ralph S. Goodwin. Robert Hazen.

MIDDLESEX COUNTY.

J. Francis Calef. Charles E. Stanley.

TOLLAND COUNTY.

Eli P. Flint.

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John G. Stanton. Charles E. Stanley.
John W. Wright. Eli P. Flint.
The President. The Secretary.

COMMITTEE ON MEDICAL EXAMINATIONS.

Horace S. Fuller. Walter L. Barber.
J. Francis Calef. Charles A. Tuttle.
Samuel M. Garlick.

COMMITTEE ON SCIENTIFIC WORK.

Leonard W. Bacon. Frederick M. Wilson.
The Secretary.

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Otto G. Ramsay. Thomas F. Rockwell.
William Bissell.

COMMITTEE OF ARRANGEMENTS.

Henry L. Swain. H. Merriman Steele.
Louis M. Gompertz.

SPECIAL COMMITTEES.COMMITTEE TO CONSIDER THE BEST METHODS OF PUBLIC CONTROL AND
PREVENTION OF VENEREAL DISEASE.

Ralph A. McDonnell.	William H. Donaldson.
Jay W. Seaver.	Frank H. Wheeler.
Charles S. Stern.	

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Max Mailhouse.	Edwin A. Down.
Allen R. Diefendorf.	Frank K. Hallock.
The President.	

COMMITTEE ON VACCINATION.

Everett J. McKnight.	Joseph H. Townsend.
Wyeth E. Ray.	

COMMITTEE ON PSYCHOPATHIC WARDS IN GENERAL HOSPITALS.

Allen R. Diefendorf.	Max Mailhouse.
Frederick T. Simpson.	D. Chester Brown.
J. Reed Topping.	

SPECIAL COMMITTEE.

John B. Lewis.	The County Secretaries.
The State Secretary.	

COMMITTEE ON NATIONAL LEGISLATION.

William L. Higgins.

MINUTES OF THE HOUSE OF DELEGATES.

The first meeting of the House of Delegates was called to order on Wednesday, May 27, at eleven o'clock, at Harmonie Hall, 9 Elm Street, New Haven, by the President, Dr. Everett J. McKnight of Hartford. There were present Dr. Oliver C. Smith, Dr. Charles J. Foote, Dr. Edward P. Brewer, Dr. Gould A. Shelton, Dr. Frank E. Guild, Dr. Edward H. Welch, Dr. Frank K. Hallock and Dr. Cyrus B. Newton (councilors), and Dr. Levi B. Cochran, Dr. Edward R. Lampson, Dr. Harry B. Rising, Dr. William R. Tinker, Dr. Edward W. Goodenough, Dr. Charles J. Bartlett, Dr. Edward S. Moulton, Dr. James H. J. Flynn, Dr. H. Merriman Steele, Dr. John F. Hayes, Dr. Patrick J. Cassidy, Dr. George M. Minor, Dr. D. Chester Brown, Dr. William S. Randall, Dr. George H. Noxon, Dr. John W. Wright, Dr. Theodore R. Parker, Dr. Charles E. Stanley (delegates), the President, Dr. Everett J. McKnight, and the Secretary, Dr. Walter R. Steiner. The following reports were then read and accepted.

(1) Report of the Secretary, Dr. Walter R. Steiner (Hartford):

REPORT OF THE SECRETARY.

Mr. President and Gentlemen of the House of Delegates:

During the past year, the meetings of the component organizations of our Society—the County Associations—have been, on the whole, better attended, more enthusiasm has been elicited at their sessions and a closer bond of union has been established between them and their parent organization—the State Medical Society. This has been largely due to the visits of our presidents to the annual or semi-annual county meetings. To still further express this connection of our State Society with the County Associations, I, as Secretary, have

visited as many of the county meetings this year as possible and have endeavored to cement the close tie which should and must exist to promote our common weal. It seems to me that in future years the officers of our Society should make still further effort to be present at as many of our county meetings as possible.

Our membership, including the twenty-three honorary members, shows an increase of fifty-eight over that of last year, making our total number now 849. The New Haven County Association has added the most new members, the number being twenty-six. Hartford and Fairfield come next with twenty and seventeen respectively, Litchfield follows with five, Windham, Middlesex and New London with three, and Tolland with two. The names of the new members with graduation and places of residence we give below. They number seventy-seven in all.

Horace Cheney Swan, Tufts, 1903, Hartford.

Frank Joseph Ronayne, Yale, 1904, Hartford.

Otto George Wiedman, Univ. Penn., 1905, Hartford.

Thomas Norval Hepburn, Johns Hopkins, 1905, Hartford.

Henry Augustus Martelle, Johns Hopkins, 1905, Hartford.

Charles Thomas Beach, Yale, 1905, Hartford.

Edward Holden Blair, P. & S., Balt., 1906, Hartford.

Ralph Waldo Emerson Alcott, U. S. Med. Col., 1881, West Hartford.

Thomas Coy Hodgson, Toronto, 1894, East Berlin.

James Ward Ward, P. & S., Balt., 1895, Hartford.

Julius Hupert, Univ. Lemerg, 1903, New Britain.

George Francis Vail, Univ. Pa., 1902, Hartford.

Clarence Morris Hatheway, Bellevue, 1903, Hartford.

Albert Russell Keith, Harvard, 1903, Hartford.

Joseph Patrick Ryan, P. & S., N. Y., 1903, Hartford.

Joseph Henry Potts, Dartmouth, 1905, New Britain.

Arthur Heywood Griswold, Johns Hopkins, 1906, Hartford.

David James Molumpy, Jefferson, 1906, Hartford.

Morris Tuch, Bellevue, 1906, Hartford.

Felix Percy Chillingworth, Yale, 1907, Wethersfield.

Francis Nichols Boynton, Univ. Mich., 1903, New Haven.

Frank Billings Standish, Yale, 1903, New Haven.

Thomas Edward Parker, Yale, 1904, Waterbury.

Elizabeth Conover Spencer, Women's Med. Col., Pa., 1903, Waterbury.

George Arthur Leonard, Md. Med. Col., 1905, Waterville.
Michael Joseph Donahue, Univ. Pa., 1886, Waterbury.
Walter Augustine Rieley, Bellevue, 1898, Naugatuck.
Egbert Livingston Smith, Yale, 1896, Waterbury.
John Henry Dillon, Yale, 1904, Waterbury.
John Joseph Gailey, Bowdoin, 1898, Waterbury.
Isabelle Cowan, Women's Med. Col., N. Y., 1892, Waterbury.
Carl William Henze, Yale, 1900, New Haven.
Eugene Maurice Blake, Yale, 1906, New Haven.
Joseph Hooker Callbreath, L. I. Col. Hosp., 1890, Waterbury.
George Blumer, Cooper Med. Col., 1890, New Haven.
Archibald Cecil Herbert, Univ. Va., 1903, New Haven.
Mary Phylinda Dole, Women's Med. Col., Balt., 1888, New Haven.
Treba Williams Lyon, Yale, 1903, New Haven.
Harold Sears Arnold, Yale, 1903, New Haven.
Howard DeForest Lockwood, Yale, 1901, Meriden.
Milo Pember Ringe, P. & S., Cleveland, 1905, Madison.
Frederick Pollock Lane, Yale, 1904, New Haven.
Arthur Variell, Bowdoin, 1894, Waterbury.
Alletta Langdon Bedford, Cornell, 1905, Waterbury.
Theodore Bevans, Univ. Minn., 1903, Waterbury.
Harold Eliphalet Hoyt, Albany, 1904, Waterbury.
Henry Alexander Rogers, Bellevue, 1886, New London.
Edward Joseph Brophy, Yale, 1904, Norwich.
James Lawrence Sullivan, P. & S., Balt., 1901, Bridgeport.
Richard Bohannon, Univ. N. Y., 1874, Stamford.
Robert Keane, Bellevue, 1903, Bridgeport.
William Cutler Bowen, P. & S., N. Y., 1877, Bridgeport.
John Wait Avery, Univ. Va., 1897, Noroton.
James Green Burr, Univ. Balt., 1893, Stamford.
Franklin G. Brown, L. I. Col. Hosp., 1895, Norwalk.
Charles Wesley Gardner, Univ. Mary., 1901, Bridgeport.
Maurice Jacob Greenstein, Univ. Sou., 1906, Bridgeport.
Philip John Curran, P. & S., N. Y., 1901, Bridgeport.
Giovanni Formichelli, Italy, 1898, Bridgeport.
Otis White Sedgwick, Univ. Vt., 1904, Brookfield.
Albert Lewis House, Yale, 1895, Noroton.
John Joseph Ryle, Univ. Buffalo, 1897, Stamford.
John Franklin Hamin, Jefferson, 1903, Stamford.
Edmund Joseph O'Shaughnessy, Bellevue, 1899, New Canaan.
Ward Slosson Gregory, P. & S., N. Y., 1903, Norwalk.
Charles H. Girard, Victoria, 1890, Willimantic.
George Barnes, Bellevue, 1904, Killingly.
Jay Hobart Egbert, Dartmouth, 1890, Willimantic.

Robert Earl Harrington, Balt. Med. Col., 1906, Terryville.
 Harry Biglow Hanchett, Jefferson, 1905, Torrington.
 Lyman Frank Phillips, Yale, 1906, Litchfield.
 Frederick W. Wersebe, Bellevue, 1898, Washington.
 Frederick Tracy Fitch, Yale, 1904, Portland.
 Sydney Archer Lord, Harvard, 1894, Cromwell.
 Charles Clarence Davis, Yale, 1907, Essex.
 Timothy William McCarthy, Balt. Med. Col., 1906, Rockville.
 John Patrick Hannley, Cornell, 1906, Stafford Springs.

The largest gain in the County Associations is seen in New Haven, with a net gain of twenty-nine; Fairfield and Hartford follow with a gain of fourteen and ten respectively; Windham and Litchfield have gained three each and Tolland two; Middlesex has remained stationary; New London presents a loss of one. We have lost during the year thirty members, distributed as follows: by death, twelve (including two honorary members, Dr. Adrian Theodore Woodward of Brandon, Vt., and Dr. Seneca D. Powell of New York); by removal, seven; by suspension, one; by expulsion, nine; by resignation, one. Our total number is distributed among the counties as follows:

Hartford, 1907,	198	
New members,	20	
	<hr/>	218
Left the state,	1	
Suspended,	1	
Expelled,	5	
Died,	3	
	<hr/>	10
Present membership,		<hr/> 208
A gain of 10.		
New Haven, 1907,	203	
New members,	27	
Reinstated,	13	
	<hr/>	243
Expelled,	4	
Resigned,	1	
Removed,	1	
	<hr/>	6
Present membership,		<hr/> 237
A gain of 34.		

New London, 1907,	.	.	.	.	.	.	.	57	
New members,	.	.	.	.	.	.	.	3	
								<u> </u>	60
Left the state,	.	.	.	.	.	.	.	1	
Died,	.	.	.	.	.	.	.	3	
								<u> </u>	4
Present membership,	.	.	.	.	.	.	.		<u> </u> 56
A loss of 1.									
Fairfield, 1907,	.	.	.	.	.	.	.	148	
New members,	.	.	.	.	.	.	.	17	
								<u> </u>	165
Removed,	.	.	.	.	.	.	.	2	
Died,	.	.	.	.	.	.	.	1	
								<u> </u>	3
Present membership,	.	.	.	.	.	.	.		<u> </u> 162
A gain of 14.									
Windham, 1907,	.	.	.	.	.	.	.	35	
New members,	.	.	.	.	.	.	.	3	
								<u> </u>	38
Present membership,	.	.	.	.	.	.	.		<u> </u> 38
A gain of 3.									
Litchfield, 1907,	.	.	.	.	.	.	.	57	
New members,	.	.	.	.	.	.	.	5	
								<u> </u>	62
Removed,	.	.	.	.	.	.	.	1	
Died,	.	.	.	.	.	.	.	1	
								<u> </u>	2
Present membership,	.	.	.	.	.	.	.		<u> </u> 60
A gain of 3.									
Middlesex, 1907,	.	.	.	.	.	.	.	42	
New members,	.	.	.	.	.	.	.	3	
								<u> </u>	45
Removed,	.	.	.	.	.	.	.	1	
Died,	.	.	.	.	.	.	.	2	
								<u> </u>	3
Present membership,	.	.	.	.	.	.	.		<u> </u> 42
Stationary.									
Tolland, 1907,	.	.	.	.	.	.	.	21	
New members,	.	.	.	.	.	.	.	2	
								<u> </u>	23
Present membership,	.	.	.	.	.	.	.		<u> </u> 23
A gain of 2.									<u> </u> 826

I have been still unable to find either a description of the original seal or an imprint of the same. I shall, however,

continue my search, with the hope of soon being successful in the quest.

The state Transactions which come in journals will be bound and catalogued during this year, permission for the same having been obtained at our last meeting. The delay has been due to the difficulty in finding someone to do this work.

The committee to revise the application blanks and prepare a card for the card index will make a report at this meeting. To carry their work into effect will demand some outlay of money. Would it not be well to put this matter through this coming year and leave for another year the questions of fall meetings of the State Society with the different County Associations, as well as all matters involving additional expenditure, until by uniform application blanks and card indices at the offices of the state and county secretaries, both organizations will be placed upon a firm and lasting foundation, which will make for the best there is, in our practice and in our art?

Respectfully submitted,

WALTER R. STEINER,
Secretary.

(2) Report of the President, Dr. Everett J. McKnight (Hartford):

REPORT OF THE PRESIDENT.

House of Delegates of the Connecticut State Medical Society:

GENTLEMEN—In opening this, the one hundred and sixteenth annual meeting of the Connecticut State Medical Society, I feel that we are all to be congratulated upon the present condition of medical affairs in this state.

There has been little of importance to report during the year, mainly on account of the fact that there has been no session of the General Assembly since the last annual meeting.

The pure food bill, which at that time was under consideration by that body, has become a law and is in successful operation.

On May 28, 1907, the House voted to accept the unfavorable report of the committee on the anti-vaccination bills, and rejected the bills by a vote of ninety-one to fifty-three, and on June 5, the Senate took the same action by a vote of twenty to fourteen.

In accordance with a provision of the by-laws and a custom established by my immediate predecessors, I have attended one meeting of each of the County Associations, with the exception of Fairfield County, which last fall occurred on the same day as that of Litchfield County. I intended to be present at the spring meeting of the Fairfield County Association, but was unavoidably detained.

The reports of the Secretary and of the President of the Board of Councilors so completely cover the year's history that little is left for the President of the Society to say. The latter report will contain certain suggestions to which I desire you to give your most careful consideration. In addition to these, permit me to say, that, in connection with the publication of the Transactions of 1892, the centennial volume, there was printed an index of all the Proceedings to that date. This has been found of so much value that I would suggest that some action be taken at this or some subsequent meeting toward the revision of that index and for later revisions at regular intervals.

I would especially call your attention to the International Congress on Tuberculosis, which will meet in Washington in the coming September, and suggest that this Society show its interest in this important work by sending to that Congress a delegation consisting of at least five of its members.

I now declare the one hundred and sixteenth annual meeting of the House of Delegates of the Connecticut State Medical Society open and ready for business.

(3) Report of the Chairman of the Council, Dr. Frank K. Hallock (Middletown):

REPORT OF THE CHAIRMAN OF THE COUNCIL.

Mr. President and Gentlemen of the House of Delegates:

On the last day of the annual meeting of this Society, May 23d, 1907, the Board of Councilors met for organization. Dr. Frank K. Hallock was elected chairman.

Two meetings of the Board have been held during the year, the first in March and the second one a week ago. It was decided, in case no matters of importance were previously presented, to hold two stated meetings of the Board as a routine yearly practice—one in the month of March, in time to allow the presentation of any items of business to the spring meetings of the County Associations; and the other, one week before the annual session of the State Society.

The business transacted at the two meetings of the Council is herewith presented, for your consideration, in the form of recommendations, as follows:

First—Pursuant to the question raised at the final session of the House of Delegates a year ago, as to the advisability of appointing alternate delegates, it was found on inquiry that the County Associations and the American Medical Association do not recommend such appointments. It is held, and rightly, that it is the duty of each county to elect delegates who will hold true to their obligations; consequently, the Council recommends that no alternate or substitute delegates be appointed by the County Associations.

Second—In this connection it is recommended that a new paragraph be added to Section 8, Chapter XII of the by-laws to read as follows: "In the case of death, illness or disability of a councilor or delegate, the President of the County Association in which the vacancy occurs shall appoint a substitute councilor or delegate, with full power to represent his county during his disability or until the successor of such appointee is elected at the next meeting of the County Medical Association."

Third—It is recommended that Section 2 of Chapter II of the by-laws be amended by the addition of these words: "No physician shall be admitted to membership in the County Medical Associations who has agreed to furnish medical services to any secret organization or union for a stipulated sum per member, or for other consideration."

Fourth—The Council makes no recommendation regarding the resolution to contribute two hundred and fifty dollars (\$250) for a memorial to Dr. N. S. Davis. The surplus of funds of our Society is so small that it seems preferable for the House of Delegates to consider this resolution independent of any suggestions from the Council.

Fifth—At the March meeting of the Board of Councilors, Dr. McKnight proposed that a committee be appointed to confer with the Advisory Board of the *Yale Medical Journal* relative to the feasibility of publishing the Transactions of the State Society in that Journal in monthly installments, and at the end of the year to receive a bound copy of the Transactions similar to the volumes already published.

The President and Secretary of the State Society and the Chairman of the Council were appointed as this committee. Two conferences have been held with the Advisory Board of the *Yale Medical Journal* and the following proposal from Dr. C. J. Bartlett, representing that Board, has been received:

Proposal for Publishing the Proceedings of the Connecticut State Medical Society in the Yale Medical Journal and Furnishing Bound Copy of Proceedings to Each Member.

To publish the proceedings in installments in the *Yale Medical Journal* during the year, these being paged separately.

To send a copy of each issue of the *Journal* to each member of the State Medical Society and to other addresses furnished by the Secretary of the Society up to the entire number contracted for.

To bring out the first number in June or July of each year in order to get the minutes of the annual meeting to the members promptly.

To send a bound copy of the *Proceedings* to each member of the Connecticut State Medical Society by April 1st of each year, and to send to the Secretary of the Society or to addresses furnished by him

enough more bound copies to make up the total number contracted for (not less than 950), such bound copies to be uniform in size and binding with the *Proceedings* as now published.

To furnish 100 reprints of scientific articles, and twenty-five reprints of obituaries whenever such reprints are requested before printing.

To use size of page and type now used in the *Proceedings* of the Connecticut State Medical Society, and paper of at least as good quality as that now used there.

To publish the combined *Journal* and *Proceedings* under the name of the *Yale Medical Journal and the Proceedings of the Connecticut State Medical Society*.

To have graduate editors for the *Journal* (the proposed plan being to have the present Advisory Board of the *Journal* become its editors).

To have the *Proceedings* edited by the Secretary of the Connecticut State Medical Society.

The copy of articles, etc., for the *Proceedings* to be furnished by the Secretary of the Connecticut State Medical Society in convenient sized portions to make regular forms for printing and early enough for its appearance in the proper issues of the *Journal* and for the publication of the Complete *Proceedings* by April 1st.

The editors of the *Yale Medical Journal* to receive from the Connecticut State Medical Society two dollars and twenty-five cents (\$2.25) for each copy of the *Proceedings* contracted for, the entire number to be not less than 950 copies.

Illustrations, and alterations due to changes in proof by the author to be paid for extra at cost price.

Any material increase in the number of pages of the *Proceedings* over that of 1907 to be paid for at *pro rata* rates.

An agreement to be made for publishing the *Proceedings* under the above conditions for not less than three years.

For the Advisory Board of the *Yale Medical Journal*,

(Signed) C. J. BARTLETT.

May 16, 1908.

The Board of Councilors have carefully considered the above proposal and would recommend that the experiment be tried of publishing the *Proceedings* under the auspices of the *Yale Medical Journal* and subject to the conditions therein contained.

Sixth—It is recommended that the House of Delegates appoint a committee to arrange a schedule so that the meetings of the County Associations do not take place upon the same day.

Seventh—Upon the proposal of Dr. McKnight, the following resolution, offered by him, was passed: "That the State Society hold a fall meeting each year in connection with some one of the County Medical Associations except those of New Haven and Hartford Counties, and that the expense for printing and rental of rooms or hall be paid for equally by the State Society and the County Society where the meeting is held. Furthermore that the committee on scientific work of the State Society coöperate with a similar committee from the County Association to prepare a program for said meeting."

The proposition for such a joint meeting has been presented to the various County Associations and has received their unanimous approval. The New London County Association stands ready to invite the State Society to hold a joint session under its auspices this coming fall. The Council recommends that the House of Delegates accept this invitation of New London County and try the experiment under the conditions named in the above resolution.

Nine hundred and thirteen volumes of the Transactions for 1907 have been sent to members of this Society and to all others entitled to receive them. Thirty-seven copies remain on hand. The total cost of printing and distributing this issue of the Transactions has been \$1,197.65. The sum of \$114.05 was expended for general printing and stationery in conducting the affairs of the Society.

The salary of the Secretary for the past year was fixed at \$150.00, the same as previously paid.

The auditing committee, Drs. G. A. Shelton and C. J. Foote, have examined the accounts of the Treasurer and found them correct. The balance on hand is \$1,856.18, and taxes due and uncollected \$390.00, as against \$360.00 for last year.

The Board would advise a tax of \$3.00 per member for the ensuing year.

As the nominating committee the Councilors present the following nominations:

NOMINATIONS.

*President.*SELDOM B. OVERLOCK, *Pomfret.**Vice Presidents.*IRVING L. HAMANT, *Norfolk.*WALTER L. BARBER, *Waterbury.**Secretary.*WALTER R. STEINER, *Hartford.**Treasurer.*JOSEPH H. TOWNSEND, *New Haven.**Committee on Scientific Work.*Oliver C. Smith, *Hartford.* Rush W. Kimball, *Norwich.*

The Secretary.

*Committee on Medical Examinations and Medical Education.*J. Francis Calef, *Middletown*, to succeed himself.*Committee on Public Policy and Legislation.*E. J. McKnight, *Hartford.* Elias Pratt, *Torrington.*C. J. Foote, *New Haven.* C. C. Gildersleeve.L. F. LaPierre, *Norwich.* C. E. Stanley, *Middletown.*F. M. Wilson, *Bridgeport.* E. P. Flint, *Rockville.**Committee on Honorary Members and Degrees.*William G. Daggett, *New Haven.* Henry S. Noble, *Middletown.*Charles B. Graves, *New London.**Delegate to the American Medical Association.*

Everett J. McKnight, for two years.

*Delegates to State Associations.**Maine.*J. M. Kenniston, *Middletown.* P. H. Ingalls, *Hartford.**New Hampshire.*Frank Tiffany, *Stamford.* J. C. Kendall, *Norfolk.*

Vermont.

T. R. Parker, Willimantic. T. F. Rockwell, Rockville.

Massachusetts.

O. C. Smith, Hartford. C. J. Bartlett, New Haven.

Rhode Island.

A. E. Barber, Bethel. C. E. Brayton, Stonington.

New York.

D. R. Lyman, Wallingford. L. W. Bacon, New Haven.

New Jersey.

R. S. Goodwin, Thomaston. R. A. McDonnell, New Haven.

Pennsylvania.

E. P. Swasey, New Britain. H. Blodget, Bridgeport.

Respectfully submitted,

FRANK K. HALLOCK,
Chairman.

DR. EDWARD S. MOULTON (New Haven): I move that a committee of three be appointed by the Chair to consider the suggestions and recommendations in the report of the Chairman of the Council.

Motion adopted.

THE PRESIDENT: I nominate as that committee Dr. Edward S. Moulton (New Haven), Dr. H. Merriman Steele (New Haven), and Dr. D. Chester Brown (Danbury).

(4) Reports of the Councilors from the different counties in the state:

REPORTS OF THE COUNCILORS.

(a) Hartford County, by Dr. Oliver C. Smith:

Mr. President and Gentlemen of the House of Delegates:

The Hartford County Medical Association is happy in being able to report to you that the past year has been our most pros-

perous in point of membership numbers, and in other respects has been one of progress and harmony.

We have elected twenty members this year, and have lost three by death, five have been dropped and one suspended, and our enrollment is now two hundred and eight, a gain of ten over that of 1907. Our Association has suffered the loss by death of Dr. George J. Holmes, nose and throat specialist of New Britain and Hartford; Dr. Arthur D. Hayes, general practitioner of Hartford, and, during the time of his illness, clerk of the Hartford Medical Society; and Dr. Charles Carrington of Farmington. Dr. Carrington was the last of a notable family of professional men, and bore an honored name and an enviable reputation.

Probably at no time in the history of the Hartford County Medical Association has there been so inclusive a membership as now, but there is still work to be done in this direction. There are a few eligible men who should become members, and it is the earnest desire of the officers of the Association that the members throughout the county shall do everything in their power to add those who are still delinquent in applying for membership.

At no time has the practice of medicine been so well regulated by law as at present, a condition largely due to the indefatigable efforts of the committee on legislation of our State Society; but there are still instances of fraudulent practitioners who, by hook or crook, manage to keep within the pale of the law. It behooves each of us in our county to do our utmost to guard the public from such imposters, and to report the case of any illegal practitioner to the chairman of the committee on public health and legislation.

Both fall and spring meetings of the Association have been well attended, the average attendance being eighty. The papers have been of unusual professional interest, and the discussions brisk and profitable. At the spring meeting a vote was taken expressing almost unanimous sentiment against the admittance of men doing contract work, using the word contract as defined by Dr. J. B. Lewis.

Dr. Edward K. Root has proved an excellent president, and Dr. Frederick B. Willard has been a most efficient clerk.

On the whole the year has been one of expansion and improvement in our professional life. Members are appreciating more and more the importance of closer association and more frequent professional intercourse. This is manifested by the increase of interest in the local societies throughout the county, and it is through this channel that men come to respect and trust one another, and in this as in no other manner is our usefulness to the public enhanced.

Respectfully submitted,

OLIVER C. SMITH,
Councilor.

(b) New Haven County, by Dr. Charles J. Foote:

Mr. President and Gentlemen of the House of Delegates:

The Councilor for New Haven County reports a successful year for the New Haven County Association. The Association has had two largely attended meetings. It has admitted twenty-six new members and has had no deaths. It adopted a revised constitution at its May meeting in an attempt to bring it more in conformity with the constitution of the State Society.

There is abundant talent in the Association and a considerable number of men who are doing original work, whose presence and papers would add greatly to the worth of the meetings. Unfortunately the spirit of the meetings has not been such as to attract them. Knowledge and enthusiasm for learning are plants which have not flourished greatly in our soil of late. How an atmosphere more favorable for their growth can be developed is a vital question with us. The social part of the Association needs no stimulation. It takes care of itself and furnishes all the relaxation and refreshment that seem necessary. The attendance at the dinners is large.

Much of the time of our meetings is used up with business and hearing reports of committees. Far be it from the Councilor to criticize his County Society, yet he must render a truth-

ful account and admit that a large part of the meetings have not been devoted to a consideration of the opsonic index, the parathyroids, and other burning questions, but rather to a consideration of what methods to adopt to collect dues from delinquent members, and of how to deal with contract practice in Waterbury. The first of these questions is nearly solved. When the second one has been thoroughly discussed we will perhaps be ready to get down to some scientific work.

The druggists of the county have appreciated our need of instruction in writing prescriptions and have appeared before us with preparations made according to the "National Formulary." Their presence was welcome.

There is a feeling prevalent that our Association would accomplish more of real worth if the business of the Association were turned entirely over to a committee and the meetings given up to the reading of papers and a discussion of them.

Respectively submitted,

CHARLES J. FOOTE,
Councilor.

(c) New London County, by Dr. Edward P. Brewer :

Mr. President and Gentlemen of the House of Delegates:

The New London County Medical Association has experienced an awakening. The annual meeting held in April of this year was the largest and most spirited for many years, more than one-half of the members being present.

President McKnight, Secretary Steiner, and Dr. Frank K. Hallock represented the Connecticut State Medical Society and made addresses.

President McKnight spoke of the desirability of a semi-annual meeting of the Connecticut State Medical Society, to be held jointly with some County Association, and requested an expression of opinion. The suggestion was received with enthusiasm and a committee was appointed to invite the State Society to unite with the New London County Medical Asso-

ciation in October, provided the semiannual meetings were authorized by the honorable House of Delegates.

A new constitution was adopted to conform with the charter and by-laws of the Connecticut State Medical Society. The essay and following discussion were both entertaining and instructive. The general good-fellowship among the profession and the interest renewed augurs well for the future prosperity of the Association.

Respectfully submitted,

EDWARD P. BREWER,
Councilor.

(d) Fairfield County, by Dr. Gould A. Shelton :

Mr. President and Gentlemen of the House of Delegates:

In saying that the Councilor of Fairfield County has been charged to report a condition of reasonable peace and concord, would be the echoing voice from each of her towns. The profession has been doing a satisfactory work with us, marked with a zeal born of conscientious duty. Earnest workers have plodded on, reaping their merited reward, while others, perhaps envious of their success, have redoubled their own efforts, and, through it all, our fellowship has strengthened. If disputes have arisen, they have been too slight to test the diplomacy of the Councilor, and all differences must have been adjusted on the nearest field of medical honor.

Our annual and semiannual meetings have been well attended; that interest so helpful to the prosperity of the Association is especially marked, and much valuable material of a literary character has been presented.

The stimulation furnished by the several local Associations is very sensibly felt in the added interest as shown in the work of the county organization. It becomes clearly apparent that the activity of local medical centers, reaching out into the rural territory around them, helps greatly to maintain a vigorous growth of medical life throughout the entire county.

The increase in our membership is most encouraging, and much credit is due to our earnest and active Secretary. His appointment of a local secretary in each town of the county, charged with the duty of reporting twice yearly to him the medical conditions in their respective towns, the date and number of arrivals and removals of physicians of all grades and kind, their individual effort for membership,—in fact everything of medical interest that may have occurred, brings him in close touch with every part of the county. It is of interest to note the pleasing way in which these several appointments have been accepted, showing the willing helpfulness of individual members in the general upbuilding of the profession.

The Great Reaper has detained for Himself, during the passing year, only two of our number. The going out of the lives of Drs. Stanton and Wade, when their duty seemed unfinished, is surely a marked loss to the communities where their life work had been laid.

It is worthy of mention that the profession of Fairfield County is proving itself the watchful guardian of its health. Sanitation, in a much needed field, has recently engaged the attention of the local Association of Bridgeport. An organization for maintaining the purity and high standard of the milk product has taken a definite form, and a committee of ten, of acknowledged ability, are prepared to make examinations of milk submitted to them, and, if of satisfactory standard, will issue to the dealer a certificate, and require of him the observance of such rules as will maintain the high standard of this important food product. This positive danger lurking in impure milk, and detected only by bacteriological examination, becomes a peril demanding strenuous action.

It is very encouraging to report that in the local Associations of our county the members have taken a positive stand on the question of society contract practice, in barring from membership such medical men as persist in continuing this unprofessional work. It is unethical and can but tend to

the demoralizing of that high medical character for which we all should strive. It is, I believe, as unsatisfactory to the better society membership as it must be to the medical contractor, who attempts to carry commercialism of the baser kind into the most benevolent of professions.

A movement for the establishment of a sanitarium for tuberculosis, which is so much needed in our county, has now taken on an activity which promises well for the satisfactory carrying out of this laudable enterprise. The work waiting for it appeals strongly to the laity and the profession alike, and a realization of it is anxiously looked for, and will be joyously welcomed.

Respectfully submitted,

GOULD A. SHELTON,
Councilor.

Shelton, Conn., May 27, 1908.

(e) Windham County, by Dr. Frank E. Guild:

Mr. President and Gentlemen of the House of Delegates:

The Windham County Medical Society has had another prosperous year, with no loss of membership and a gain of two.

Everything has been harmonious, with no differences for the Councilor to adjust.

The two meetings of the year were well attended; in fact, the meeting in Putnam had more members present than has been recorded in the last twenty years.

The county is fortunate in having two hospitals within its borders—the Day Kimball at Putnam, and St. Joseph's, established within the past year at Willimantic. Both are doing good work and are well patronized.

Respectfully submitted,

FRANK E. GUILD,
Councilor.

(f) Litchfield County, by Dr. Edward H. Welch:

Mr. President and Gentlemen of the House of Delegates:

It gives me pleasure to represent, as Councilor, the oldest Medical Society in these United States, but it gives me still greater pleasure to report, for our old Association, the passing of a very beneficial and prosperous year.

Both meetings of the past year have been represented by about seventy per cent. of the members, who were amply repaid by hearing the very able papers of our distinguished guests as well as those of a high order from our members.

Five new members have been added to our number, while one removed to New Haven County.

We regret to report the loss of one member by death, William J. Ford, a man who was an honor to the profession and highly esteemed in the community. The obituary written by Dr. Page was read by him at our annual meeting.

During the year the newly amended by-laws, to coincide with those of the State Society, were printed and placed in the hands of each member.

The following resolution regarding the holding of the fall meetings of the Connecticut State Society was adopted:

Resolved: That it is the sense of the Litchfield County Medical Association, that if the fall meetings of the Connecticut State Medical Society were held in the several counties, it would be of great value to the medical profession.

The question that agitates the Association more than any other is that of contract labor. While it was shown at our annual meeting that the very great majority of the members were opposed to contract work, the following resolution was passed after free discussion:

Resolved: That it is the sense of the Litchfield County Medical Association that contract work for lodges and other organizations is not for the best interest of the Society.

We trust, however, that this measure will take a more pronounced form at our next annual meeting.

Respectfully submitted,

E. H. WELCH,
Councilor.

May 22, 1908.

(g) Middlesex County, by Dr. Frank K. Hallock:

Mr. President and Gentlemen of the House of Delegates:

No events of especial medical interest have occurred in Middlesex County during the past year. One affair, however, of considerable local interest, deserves mention. This was the dinner and reunion held in Middletown, December 9, 1907, commemorating the sixtieth anniversary of the founding of the Central Medical Association. This Association includes the physicians of Middletown and vicinity and corresponds to the medical societies of the larger cities of the state. The occasion was a happy one and served its purpose well in uniting in good comradeship the members of the profession.

The county hospital at Middletown, called the Middlesex Hospital, has had an excellent year. The wards and private rooms have been well filled and excellent medical service has been rendered the county. At a recent meeting of the Board of Directors, it was voted to build a children's ward, increase the laundry and kitchen facilities and provide new accommodations for the nurses.

The Connecticut Hospital for the Insane has been subjected during the past winter, as you know, to considerable comment and criticism in the newspapers. The physicians of Middlesex County, being mostly familiar with the workings of the institution, are proud of its standing and record. It is an especial privilege to speak of the Superintendent, Dr. Henry S. Noble, and his efficient medical staff. The corps of physicians managing this institution we do not believe can be excelled for ability and faithfulness.

It is with great regret that we have to record the death of Drs. Charles H. Hubbard of Essex and Edward P. Nichols of Killingworth. Both men were ripe in years and in service in their profession, and their memory will long be cherished in the annals of our County Association.

No personal dissensions have arisen among the members of the County Association, and the only fault in our record is the continued presence of a small amount of society con-

tract work. Last year I reported that this difficulty had been settled, but it now appears that the practice has not entirely been abandoned. I feel confident, however, that our county will finally be successful in dispelling this one cloud in our otherwise blue sky.

Respectfully submitted,

FRANK K. HALLOCK,
Councilor.

Cromwell, Conn., May 27, 1908.

(h) Tolland County, by Dr. Cyrus B. Newton:

Mr. President and Gentlemen of the House of Delegates:

I have the pleasure of reporting that in Tolland County we have no delinquents, all the practicing physicians being active members except those who are of Eclectic and Homeopathic Societies. I have had no case for correction or reproof. Our April and October meetings are fully attended. Proportionately, we have a larger attendance than the medical meetings of the larger and more central counties, notwithstanding the often greater distances of travel. In the outlying counties, though less in numbers, we are in no sense a whit less in our zeal to keep up to date in our studies and practice. We are not in hourly touch with each other, but by the telephone we are at the next door.

At our last meeting we had under consideration the contract system. Voted it to be derogatory and below the standard of medical ethics; also the giving of testimonials extolling a patent medicine for the benefit of the manufacturer and to the abasement of the physicians.

There was also before our Society the subject of securing admission of respectable and registered physicians. Often we learn, on our invitation to become members of our County and State Medical Society, they are already affiliated with another society. Those who do not wish to join, who are outside, may not make desirable members, and still others who gravitate

to the Eclectic or Homeopathic Societies. Those who will come by our solicitation we gladly welcome, in the name of good-fellowship and mutual interest in our great work of preventing disease as well by sanitary laws and practice. All the laws relating to sanitation have been enacted through the united efforts of our profession. I had the honor and satisfaction of being on the legislative committee when the Medical Practice Act was fought through our Legislature, Mr. Gross being our good legal adviser. We met the most persistent opposition; they had money, influence and prejudice against us. The vaccination law has yet to be defended, that we may never again know of cities depopulated, as before the time of Jenner, from variola.

Respectfully submitted,

C. B. NEWTON,
Councilor.

Stafford Springs, May, 1908.

(5) Report of the Treasurer, Dr. Joseph H. Townsend (New Haven), to the Connecticut State Medical Society, for the year ending May 28, 1908:

REPORT OF THE TREASURER.

RECEIPTS.

Balance from old account,	.	.	.	.	.	\$1,680.58
Cash from County Clerks:						
Hartford County,	.	.	.	.	\$531.90	
New Haven County,	.	.	.	.	724.50	
New London County,	.	.	.	.	159.30	
Fairfield County,	.	.	.	.	353.70	
Windham County,	.	.	.	.	108.00	
Litchfield County,	.	.	.	.	140.40	
Middlesex County,	.	.	.	.	108.00	
Tolland County,	.	.	.	.	43.20	
					<hr/>	
Total receipts from taxes,	.	.	.	.	.	2,169.00
						<hr/>
						\$3,849.58

DISBURSEMENTS.

Dr. F T. Simpson, anniversary chr.,	\$ 78.40
Hartford Medical Society, . . .	15.00
Committee on Vaccination, . . .	126.35
Attorney's fee,	200.00
Stenographer,	50.00
Proceedings, printing and distributing, .	1,197.65
Printing and stationery,	114.05
Postage,	9.00
Telephone, cartage, etc.,	5.30
Clerical work,	10.00
Salary of Secretary,	150.00
Expenses of Secretary,	7.65
Salary of Treasurer,	25.00
Bond of Treasurer,	5.00
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	\$1,993.40
Cash to balance,	1,856.18
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	\$3,849.58

ARREARS IN TAX LAID MAY 23, 1907.

Hartford County,	\$ 27.00
New Haven County,	204.00
New London County,	3.00
Fairfield County,	93.00
Windham County,	9.00
Litchfield County,	48.00
Middlesex County,	none
Tolland County,	6.00
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Total,	\$390.00

Respectfully submitted,

JOSEPH H. TOWNSEND,
Treasurer.

This is to certify that we have examined the accounts of the Treasurer and find them to be correct.

CHARLES J. FOOTE,
GOULD A. SHELTON.

May 27, 1908.

(6) Report of the Committee on Public Policy and Legislation, by Dr. Phineas H. Ingalls (Hartford) :

REPORT OF THE COMMITTEE ON PUBLIC POLICY AND LEGISLATION.

Mr. President and Gentlemen of the House of Delegates:

The Committee on Public Policy and Legislation beg leave to report that no matters concerning public legislation have been brought to their attention during the past year, consequently no sessions have been held.

Respectfully submitted,

P. H. INGALLS,
Chairman.

(7) Report of the Committee on Medical Examinations and Medical Education, by Dr. C. A. Tuttle (New Haven) :

REPORT OF THE COMMITTEE ON MEDICAL EXAMINATIONS AND MEDICAL EDUCATION.

Mr. President and Gentlemen of the House of Delegates:

The Committee on Medical Examinations and now also on Medical Education in this state presents herewith its fifteenth annual report. The work of the committee this year has been carried on much on the same lines as in the last few preceding years, with such modifications and adjustments only as conditions demanded or as required by the modified law.

Three examinations have been held and sixty-eight candidates examined. Of these, fourteen, or 20.5 per cent., have failed to reach our standard. There have also been examined twenty-one in midwifery, of whom eleven, or 50.2 per cent., have failed. The number examined in general practice, viz., sixty-eight, is twelve below the number of last year and fifteen below the average for the past five years. It is interesting to note that there has been a gradual decline in the number

examined during the last few years quite in ratio to the increased requirements.

The Secretary has been ably assisted in his work during this last year by Dr. B. I. Tolles, his associate, and to him the committee wishes to express thanks.

The long and efficient service of Dr. Calef ends with this year. He has throughout several years given freely of his time, energy and capabilities to the committee, and to him is due the cordial appreciation of the committee and this Society.

Respectfully submitted,

CHARLES A. TUTTLE,
Secretary.

Accompanying is the set of rules under which the committee is acting; a list of candidates successful since the last report, and a set of questions used at the last examination.

RULES FOR EXAMINATION.

1. Examinations will be held on the second Tuesday of March, July and November, at the City Hall, New Haven, beginning at 9.30 A. M., and lasting two days, closing at 4.30 P. M. of the second day.

2. Examinations will be conducted in writing in the English language.

3. Examinations for general practice consist of ten questions in each of the following branches: 1 Anatomy. 2 Physiology. 3 Medical chemistry and hygiene. 4 Materia Medica, including therapeutics. 5 Practice, including pathology and diagnosis. 6 Obstetrics, including gynaecology. 7 Surgery.

4. In order to obtain a certificate of qualification the applicant must obtain a general average of 75 per cent. In no branch shall his percentage be less than 60, and in Practice, Obstetrics and Surgery the minimum requirement will be 65 per cent.

5. Examination fee, \$15.00, payable in advance on the first day of examination. Candidates once rejected may be reexamined at any subsequent meeting of the Board but must pay full fee for each trial.

6. All candidates must be graduates of some reputable medical college and must present their diplomas (or a certificate from the Dean of the medical college) for inspection, to the Secretary of the Board at the opening of the session. As evidence of the required preliminary education, he must also present a diploma from an accepted high or preparatory school or documentary proof that this preliminary education is equivalent thereto. From and after January 12, 1912, no person can be admitted to the examinations until, in addition to the foregoing, he shall present evidence of his having completed a satisfactory course of study of at least nine months in Chemistry, Physics and General Biology.

7. Each candidate must present his photograph as a means of identification. This will be retained and kept on file by the Secretary.

8. Formal application (blank enclosed) must be made to the Secretary at least five days before the date of the examination. This must be accompanied by a certificate of good moral character signed by two reputable citizens of this state.

9. Questions used at some former examinations will be found in the yearly Proceedings of the Connecticut Medical Society—the Board is unable to supply copies.

10. A license or an examination in another state is not accepted by this Board. All candidates must undergo the regular examination. It is unlawful to practice in this state before examination and license. No temporary or provisional certificate can be given.

EXAMINATIONS IN MIDWIFERY.

1. Examinations in Midwifery will be held at the same time and place as for General Practice, and under the same rules and requirements.

2. Applicants to practice Midwifery will be examined in Midwifery only and must obtain a marking of 75 per cent.

3. Examinations will be in writing; but may be taken in the language of the applicant, the applicant to furnish and pay an interpreter acceptable to the Board.

4. The examination fee will be \$10.00 and is payable at the time of taking the examination.

5. All applicants must be graduates of some reputable college or school of Midwifery and must present her diploma for inspection at the opening of the session. A photograph is also required.

QUALIFIED IN JULY, 1907.

Austin, A. E., Jeff., 1905.

Barber, W. L., Bell., 1907.

Barnes, H. L., L. I. Med., 1907.

Bodley, G. H., Yale, 1907.

Brennan, P. J., Yale, 1907.

Chillingworth, F. P., Yale, 1907.

Coffey, J. R., Yale, 1907.

Davis, C. C., Yale, 1907.

Devitt, E. K., Md. Med., 1907.

Demming, N. L., P. & S., N. Y., 1893.

Dechter, C. L., Md. Med., 1906.

Flaherty, H. F., Yale, 1907.

Frank, P., Yale, 1907.

Goldberg, S. J., Yale, 1907.

Hall, R. W., Yale, 1907.

Hurd, L. M., P. & S., N. Y., 1895.

Kennedy, H., Yale, 1906.

Kemler, J., Univ. Md., 1907.

Lyman, E. J., Yale, 1907.

McDonald, A. F., P. & S., N. Y., 1905.

Mendillo, A. J., Yale, 1907.

Outerson, A. M., Jeff., 1906.

Provost, A. G., Yale, 1905.
Putnam, C. R. L., Harvard, 1905.
Sweeney, J. W., Yale, 1907.
Tynan, J. J., P. & S., Balt., 1907.
Tolles, B. I., Yale, 1904.
Walsh, J., Tufts, 1905.
Whipple, B. N., Yale, 1907.

IN NOVEMBER.

Chedel, R. C., Dart., 1906.
Egbert, J. H., Dart., 1890.
Griswold, A. H., Johns Hop., 1906.
Higgins, J. A., P & S., Balt., 1907.
Jackson, R. C., Univ. Vt., 1906.
Kramer, G. B., Balt. Med., 1907.
Laudry, J. N., Laval., 1901.
Moriarty, R. W., Penn., 1907.
Roeder, C. A., Yale, 1907.
Rosenbaum, L., N. Y. Univ., 1893.
Ruickoldt, C. A., Yale, 1907.
Scanlon, T. F., Yale, 1907.
Scofield, W. F., Univ. Vt., 1907.
Tarkington, C. H., Johns Hop., 1907.
Titsworth, S. R., P. & S., Columbia, 1906.

IN MARCH, 1908.

Altshul, H., P. & S., Columbia, 1887.
Doroff, L. A., Yale, 1905.
Dickinson, F. M., P. & S., Columbia, 1905.
Egan, J. J., Univ. Md., 1907.
Hendricks, A. L., Yale, 1907.
Johnston, E. H., Univ. Md., 1900.
Mangini, G., Univ. Naples, 1907.
Purney, J., Balt. Med., 1906.
Rowley, J. C., Harvard, 1906.
Smith, G. T., Univ. Md., 1897.

EXAMINATION QUESTIONS, MARCH 10-11, 1908.

PHYSIOLOGY.

(*One and one-half hours.*)

1. Explain arterial-tension, and show by what nervous and mechanical agencies it is maintained.
2. Give the functions of synovial fluid and of cartilage, and explain how the latter is nourished.
3. Describe a complete nerve; (a) name different kinds of fibers and the functions of same.
4. What is the source of saliva? name ferment and uses; also chief supply: (a) does increased vascularity increase the flow of saliva?
5. What effect follows injury or section of the semilunar canals?
6. What is the source of the corpuscles of human blood? relative number of each? their function?
7. Name the centers and the nerves which regulate intestinal peristalsis; describe their action.
8. What is the physiological significance of the normal patellar reflex? Through what nerves is it accomplished?
9. What are the normal constituents of urine and the quantity of urea excreted in 24 hours?
10. Give the physiology of milk secretion. Describe the mammary gland.

ANATOMY.

(*Two hours.*)

1. The entire skeleton in the adult consists of how many distinct bones and into what classes are they divided? Name one of each class.
2. Describe one of the following bones: femur, tibia, humerus.
3. What muscles are severed in an amputation of the forearm at its middle third?

4. Describe the fifth cranial nerve and its ganglia.
5. Give (a) the nerve supply of the rectum; (b) the blood supply of the rectum.
6. Bound Scarpa's triangle, and give its surgical importance.
7. Describe the vermiform appendix and give its relations.
8. What abdominal viscera are invested by the lesser peritoneal sac?
9. What are the structures, from without inward, which form the coverings of inguinal hernia?
10. Describe the stomach—its curves, ends, orifices, structure and glands.

SURGERY.

(Two hours.)

1. Describe in detail repair of simple fracture of a long bone.
2. Name conditions interfering with such repair and describe their action.
3. Describe fully an amputation at the shoulder.
4. Give the gross pathology of inherited syphilis.
5. (a) Name in order of frequency the varieties of cancer of the stomach. (b) Give the average and minimum duration of these varieties.
6. Early diagnosis of cancer of the stomach.
7. Describe your technic in passing a catheter through a tight but dilatable stricture of the male urethra.
8. Describe your technic of a radical operation for oblique inguinal hernia.
9. (a) Give progress and treatment of a second degree burn involving one-third of cutaneous surface but not involving head and face. (b) How would age and habits as regards use of alcohol or morphia affect your prognosis? (c) How would involvement of scalp?
10. Name the surgical complications of typhoid fever and describe their first symptoms.

OBSTETRICS AND GYNAECOLOGY.

(Two hours.)

1. What is understood by the toxemias of pregnancy? How, when and where in the system are they produced?

2. How is the tendency for such toxic effects best prevented?

3. (a) What are the positive signs of pregnancy? (b) Give four signs classed as doubtful, but fairly probable. (c) Describe Hegar's sign.

4. (a) Give cause of sapraemia. (b) Give course of sapraemia. (c) Give treatment of sapraemia.

5. What effect has a contracted pelvis upon the course of pregnancy as regards: (a) The position of the uterus? (b) The position of the foetus? (c) The size of the foetus?

6. (a) What is version? (b) Give technique of combined podalic version. (c) What indications require the above method of version?

7. What symptom of puerperal infection points strongly to the involvement of the peritoneum?

8. Outline your treatment in the above form of peritonitis. (a) Preventative; (b) Local; (c) Systemic.

9. (a) Define vaginismus. (b) Give etiology. (c) Give pathology.

10. (a) What is the cause of haematuria in pregnancy? (b) Pyelo-nephritis? (c) Treatment of each.

CHEMISTRY AND HYGIENE.

(One and one-half hours.)

1. What is the chemical formula, properties, and use of plaster of Paris?

2. (a) What is hydrochloric acid? (b) Give specific gravity. (c) Where does it exist in the body? (d) By what test is it recognized?

3. (a) What are fats? (b) Name the common animal fats, and give formula for one. (c) What are some of the tests for fats?

4. What is the duty of a physician in attendance upon erysipelas to prevent further infection?
5. (a) What is oxygen? (b) What part does oxygen play in the physiological process? (c) What is the chemical process of oxidation?
6. Describe the most practical method for the disinfection of clothing, bedding and utensils of a sick room.
7. (a) How is tuberculosis transmitted? (b) How can its spread be restricted? (c) By what channels of entry does the infection reach the system?
8. What are the chemical properties of a biliary calculus?
9. What properties in the chlorides render them so valuable in disinfection? Describe the chemical action.
10. What are the toxic effects of carbolic acid? Method of treatment.

MATERIA MEDICA AND THERAPEUTICS.

(Two hours.)

1. What is the physiological action of camphor upon (a) the circulatory system and (b) the nervous system?
2. How do the following drugs modify pulmonary secretion?—creosote, potassium iodide, belladonna, ammonium chloride.
3. What is the physiological action of hydrocyanic acid (a) locally, (b) on the circulatory system, (c) on the respiratory system, (d) on the nervous system?
4. What is the action of iodine upon (a) the glandular system, (b) the skin, (c) mucous membranes? What are the symptoms of iodism?
5. What effect have the following drugs upon the alimentary tract and what is their mode of action?—nux vomica, calomel, sodium phosphate, and opium.
6. How and upon what part of the nervous system do the following drugs act?—bromide of potassium, strychnine, chloral, physostigma.

7. Treat a case of broncho-pneumonia in a child.
8. What are the therapeutic uses of the following?—iron, arsenic, quinine.
9. Give the symptoms of poisoning by the following drugs: carbolic acid, acetanilid.
10. What is the action upon the eye of the following drugs and how produced?—eserine, cocaine, atropine, morphine.

PRACTICE, PATHOLOGY AND DIAGNOSIS.

(Two and one-half hours.)

1. Differentiate by physical signs pneumonia from pleurisy.
2. Give etiology and pathology of acute nephritis.
3. Describe a case of pernicious anaemia and mention the changes in the blood.
4. Differentiate mitral insufficiency from mitral stenosis.
5. Give symptoms and pathology of locomotor ataxia.
6. Give etiology and treatment of iritis.
7. Describe a case of acute anterior poliomyelitis.
8. Give the technique of examination of the sputum for tubercle bacilli.
9. Define erysipelas. Give its course and treatment.
10. What are the causes of vomiting?

(8) Report of the Committee on Scientific Work, by Dr. L. W. Bacon (New Haven):

REPORT OF THE COMMITTEE ON SCIENTIFIC WORK.

Mr. President and Gentlemen of the House of Delegates:

There are two excellent reasons beside the perfunctory obedience to the rules of the Association for the rendering of a report of this committee. The first of these is the facilitating of the work of succeeding committees by recording the work done by the present committee, and the second is the incidental spreading upon the transactions of the Asso-

ciation of the actual programme which the committee has been able to provide for the annual meeting.

In regard to the first of these matters I would report that your committee has tried to follow as nearly as circumstances would permit the precedents of former years in these particulars.

The papers on special subjects, such as orthopaedics, neurology, laryngology, etc., are all brought together in one session, and the same is true of the general medical papers and of the general surgical papers.

The sessions of the second day do not allow an equal amount of time for the reading of papers, for the reason that the address of the President is scheduled to be delivered at noon of the second day; therefore, we have a short morning session and a longer afternoon session on the second day. Inasmuch as last year the shorter forenoon session was devoted to general medical papers and the longer afternoon session to general surgical papers, your committee deemed it expedient to reverse this order this year, giving the longer time to the medical papers and the shorter time to the surgical.

The order in which the papers follow each other on the programme is that of the alphabetical sequence of the names of the writers. The order of the names of the disputants is after the analogy of a medical consultation, assigning the junior to the first place in the discussion.

In all cases the writers of the various papers were invited to name two or more members of the Association whom they would like to have discuss their papers. In a certain number of cases, however, the writers preferred to leave the selection of the disputants to the committee.

Your committee have deemed it wise to select the readers of papers entirely from the members of the Association, believing that the objects of the Association would be better met by seeking to develop the resources of its own membership rather than in seeking abroad for papers from outsiders of prominence. Bodies which have more frequent meet-

ings, such as the various city and county societies, can perhaps advantageously assign a certain theme for more or less elaborate discussion, and at such meetings it may well be both interesting and profitable to invite the participation of outside men who may be peculiarly well versed in the theme in hand, but this plan has not seemed to your committee applicable to the annual meeting of a state society.

Partly on this ground, and partly because the offers were not received until after the programme had been already filled up, your committee thought it best to decline several papers, though they promised to be of great interest, which were offered for the annual meeting by men from other states.

Each invitation to read a paper was accompanied by a statement of the rule of the Association that the papers before the annual meeting must be limited to twenty minutes. The Secretary of the Association has likewise requested each of the writers to place in his hands a copy of the paper to be read, at least one week before the date of the annual meeting, and has taken the pains to place the same in the hands of the appointed disputants for perusal before the meeting, a practice which it is thought will do much to make the discussions more thorough and interesting.

The programme for the one hundred and sixteenth annual meeting of the Connecticut State Medical Society, held at Harmonie Hall, 9 Elm St., New Haven, on May 27 and 28, 1908, is as follows:

PROGRAMME.

WEDNESDAY AFTERNOON, MAY 27, 2 P. M.

Deformities of the Neck—Ernst H. Arnold, New Haven. (Discussion opened by Allen W. Williams, Hartford, and Ansel G. Cook, Hartford.)

Congenital Hypertrophic Stenosis of the Pylorus in Infants, with Report of a Case—Isaac W. Kingsbury, Hartford. (Dis-

cussion opened by H. Merriman Steele, New Haven, and Walter R. Steiner, Hartford.)

Early Diagnosis of Spinal and Cerebral Tabes—John C. Lynch, Bridgeport. (Discussion opened by Robert E. Peck, New Haven, and Max Mailhouse, New Haven.)

Attempts at Exact Diagnosis of Intra-Cranial Lesions following Middle-Ear Disease—E. Dorland Smith, Bridgeport. (Discussion opened by E. Terry Smith, Hartford; Henry L. Swain, New Haven, and Frederic M. Wilson, Bridgeport.)

The Use of the Bronchoscope and Œsophagoscope in the Location and Removal of Foreign Bodies in the Air and Food Passages—Henry L. Swain, New Haven. (Discussion opened by E. Terry Smith, Hartford, and Carl E. Munger, Waterbury.)

THURSDAY MORNING, MAY 28, 9.30 A. M.

General Pathological Conditions Occurring with Uterine Fibroids—Henry G. Anderson, Waterbury. (Discussion opened by Otto G. Ramsay, New Haven; Charles E. Taft, Hartford, and Phineas H. Ingalls, Hartford.)

Treatment by Bier's Hyperaemia—Alfred M. Rowley, Hartford. (Discussion opened by Philip D. Bunce, Hartford, and Leonard W. Bacon, New Haven.)

Gastro-jejunosomy—Edward W. Smith, Meriden. (Discussion opened by John B. Boucher, Hartford; William F. Verdi, New Haven, and Oliver C. Smith, Hartford.)

The Prognosis in the Suture of Nerves—Ernest A. Wells, Hartford. (Discussion opened by Joseph M. Flint, New Haven, and Harry B. Ferris, New Haven.)

The President's Address, 12 M.—Everett J. McKnight, Hartford.

THURSDAY AFTERNOON, MAY 28, 2:30 P. M.

The Etiology and Treatment of Puerperal Infections—Walter L. Barber, Waterbury. (Discussion opened by B. Austin Cheney, New Haven; Otto G. Ramsay, New Haven, and Phineas H. Ingalls, Hartford.)

Some Observations on Grocco's Sign—George Blumer, New Haven. (Discussion opened by Walter R. Steiner, Hartford, and William G. Daggett, New Haven.)

The Bearing of Recent Investigations on the Treatment of Typhoid Fever and its Complications—Charles J. Foote, New Haven. (Discussion opened by Charles J. Bartlett, New Haven, and Gustavus Eliot, New Haven.)

A Case of Family Periodic Paralysis—Max Mailhouse, New Haven. (Discussion opened by Charles N. Haskell, Bridgeport, and Frederick T. Simpson, Hartford.)

Acute Pleurisy—Nelson A. Pomeroy, Waterbury. (Discussion opened by Charles J. Foote, New Haven, and Edward K. Root, Hartford.)

The chairman does not wish to close this report without acknowledging the hearty coöperation of his colleagues, who made three trips to hold meetings of the committee in New Haven, and took each a generous share of the work in soliciting the papers for the programme. The previous knowledge of the Secretary of the Society, who is, *ex officio*, a member of the committee, was of great service in arranging the details of the work, and the pains taken by the President of the Society to attend at least two of the meetings, bespeaks a zeal in the welfare of the Society for which the committee feels great appreciation. Your committee notes likewise with pleasure the sentiment which appears to prevail among the members of the Society to whom they had occasion to address themselves in the quest for papers, a sentiment which indicates a lively interest in the Society and seems to make it a matter of compliment to be asked to address the Society at its annual meeting.

Respectfully submitted,

LEONARD W. BACON,

Chairman of the Committee on Scientific Work.

DR. EDWARD W. GOODENOUGH (Waterbury): I move that this report be accepted and printed, and that our thanks be

extended to Dr. Bacon and the remaining members of the committee for the excellent work in preparing the programme of this meeting. Adopted.

(9) Report of the Committee on Honorary Members and Degrees, by Dr. Otto G. Ramsay (New Haven). Read by the Secretary in the absence of Dr. Ramsay:

REPORT OF THE COMMITTEE ON HONORARY MEMBERS AND DEGREES.

Mr. President and Gentlemen of the House of Delegates:

The Committee on Honorary Members and Degrees have to report that no names have been referred to it for consideration, either for honorary membership, or for the conferring of a degree.

Respectfully submitted,

OTTO G. RAMSAY.

(10) Report of the Committee on Arrangements, by Dr. Henry L. Swain (New Haven):

REPORT OF THE COMMITTEE ON ARRANGEMENTS.

Mr. President and Gentlemen of the House of Delegates:

Following the precedent, the Chairman of this committee has volunteered to come before you without an elaborate written report, inasmuch as the work of the committee is such as is best discussed in other ways than formally, in such a gathering. The committee takes great pleasure in presenting to you its compliments. We hope you will test to your full capacity a little later the nature of the entertainment that is to be provided, and we trust you will all have an enjoyable time while you are here. As a report of the committee still further, I have simply to offer the programme as it has been sent you.

I am glad that so many of you are present now, and that we have a prospect of a very large gathering for the exercises to-morrow.

(The following was planned for the entertainment of the members of the Society and their guests. On Wednesday evening, May 27, at 8.30 p. m., Dr. Oliver Thomas Osborne cordially invited them to a smoker, at the Union League Club, 1032 Chapel Street. On the following day they were invited by the Committee of Arrangements to be present at a luncheon, at Heublein's Cafe, at one o'clock. The annual dinner was to be held on Thursday evening, May 28, at 8 o'clock, at the Yale Dining Hall. The price of the dinner was \$2.50 a person. Previous to the dinner a reception would be held in the President's room of the rotunda of Woolsey Hall, corner of College and Grove Streets.)

(II) Report of the Committee on Venereal Diseases, by Dr. R. A. McDonald (New Haven):

REPORT OF THE COMMITTEE ON PREVENTION OF VENEREAL DISEASES.

Mr. President and Gentlemen of the House of Delegates:

Your committee would respectfully report that its members have been on the alert for any legislation which might bear on the subject, and have been able to learn of none in the past year.

The members of the committee have tried individually to spread the knowledge of the dangers of venereal diseases among their patients, and have delivered a few public lectures on the subject.

But with the attitude of the American public, opposed as it is to the licensing of prostitution, there seems to be no feasible method of public control of venereal diseases.

It therefore seems to your committee that the physicians must assume the responsibility of enlightening the public as to the dangers of such diseases, and must emphasize the

importance of thorough and persistent treatment even for cases which appear to be mild.

Respectfully submitted,

R. A. McDONNELL,
JAY W. SEAVER,
FRANK H. WHEELER,
Committee.

The committee was continued for another year.

(12) Report of the Committee on a Colony for Epileptics in Connecticut, by Dr. Max Mailhouse (New Haven):

REPORT OF THE COMMITTEE ON A COLONY FOR EPILEPTICS IN CONNECTICUT.

Mr. President and Gentlemen of the House of Delegates:

At the last meeting of this Society your committee made a report of considerable progress on the work already accomplished, and a bill before the General Assembly at that time had been recommended by the Committee on Humane Institutions. Subsequently the bill came up for a hearing before the Committee on Appropriations, and was ably supported by members of the profession as well as by laymen interested in the matter; no opposition appeared at the hearing. Notwithstanding the favorable course of events throughout its career to the close of this hearing, the committee failed to make a recommendation beyond that of laying the matter over to the next General Assembly without comment. We feel that the appropriations already made for many objects, even less pressing than this, led to the side-tracking of our measure. We also feel, that in order to secure an appropriation next year, the matter should reach the proper committee early in the session and before the funds of the state shall have been already depleted by other and less worthy demands. For this work it is essential that the Committee on Public Policy and Legislation, its attorney included, as well as the individual

members of this Society, take hold, and, at the proper time, aid in pushing our work to satisfactory completion. Other states are outstripping us in the good cause; New York is already establishing her second colony. May we soon be able to boast of one of our own.

Respectfully submitted,

MAX MAILHOUSE,
EDWIN A. DOWN,
FRANK K. HALLOCK,
A. R. DIEFENDORF,
Committee.

The committee was continued for another year.

(13) Report of the Committee to Prepare a Pamphlet upon Vaccination, by Dr. E. J. McKnight (Hartford). Read by the Secretary:

REPORT OF THE COMMITTEE TO PREPARE A PAMPHLET UPON VACCINATION.

Mr. President and Gentlemen of the House of Delegates:

The committee to prepare a pamphlet upon Vaccination respectfully reports that, having prepared such pamphlet over a year ago, it knows of no reason why said committee should not be discharged with thanks.

The committee further reports that there are a large number of the said pamphlets still in the possession of the Society for future distribution.

Respectfully submitted,

E. J. MCKNIGHT,
J. H. TOWNSEND,
*Committee to prepare a pamphlet
upon Vaccination.*

(14) Report of the Committee on Psychopathic Wards in General Hospitals, by Dr. Allen R. Diefendorf (New Haven):

REPORT OF THE COMMITTEE ON PSYCHOPATHIC WARDS IN GENERAL HOSPITALS.

Mr. President and Gentlemen of the House of Delegates:

Although your committee cannot yet report the actual establishment of a psychopathic ward in any of the large general hospitals of the state, it can report definite progress. The committee has been consulted in reference to the establishment of such wards in two hospitals, in one of which the matter has been favorably acted upon. The greatest drawback in securing the immediate establishment of psychopathic hospitals and wards where your committee has created interest, is the lack of available funds.

The most encouraging sign of the year has been the establishment of the Connecticut Society for Mental Hygiene, which will have at its disposal funds for the active prosecution of the work along the lines proposed in the 1907 report of your committee. Members of your committee have been made honorary members of this society and have been frequently consulted in reference to the work. The establishment of this society enlarges the opportunity for usefulness in a work in which the Connecticut Medical Society should take an active part.

Respectfully submitted,

A. R. DIEFENDORF.

The committee was continued for another year.

(15) Report of the Special Committee to revise the application blanks and prepare a card for the Card Index. Read by the Secretary in the absence of Dr. Lewis:

REPORT OF THE SPECIAL COMMITTEE.

Mr. President and Gentlemen of the House of Delegates:

Your committee "to revise the application blanks for membership and make them uniform in all the counties, and to prepare a definite card for all the card indices of membership,"

would respectfully present for your consideration the following report:

In our effort to make said application blanks uniform it was evident that we should first consider what the State Society determined shall be the qualifications for membership.

We find that Chapter XII, Section 2, of our by-laws declares that while "each County Association shall judge of the qualification of its own members, * * * every reputable and legally registered physician who does not practice or claim to practice or lend his support to any exclusive system of medicine, shall be entitled to membership."

It is left, then, to the County Association to "judge" of the evidence which may come before it: first, of an applicant's reputation; second, of the fact covering his legal registrations; and third, whether he does or does not practice or lend his support to any exclusive system of medicine. All of this language seems simple enough and free from ambiguity except the word *exclusive* as applied to a *system of medicine*. Of the three examining boards in Connecticut, will either one of them admit that its candidates for registration practice an exclusive system? One of these boards is labeled "Eclectic." The Standard Dictionary defines that word as follows: "One who believes in or practices selection from *all systems* or sources, especially in philosophy or in medicine." Another board is called Homeopathic. That, as a system, is undoubtedly exclusive, inasmuch as its founder declared it to be formulated solely on the principle that "like cures like," but it is a well-known fact that few, if any, of its disciples of the present day adhere strictly, if at all, to that alleged principle.

Furthermore, in the opinion of your committee, the by-law quoted does not specifically and definitely withhold membership from any one who practices an exclusive system. It simply declares that every physician who does *not* thus practice shall be entitled to membership, while it is silent as to those who *do*, and thereby it leaves us in doubt, or, at least, open only to conjecture, to inference, or to indecisive opinions.

In several instances, unsatisfactory results have already followed this condition of things, as your committee is informed. While it seems to us that it was the intent of the Society to consider the so-called *exclusive system practitioners* as disqualified for membership, yet we think it would be more simple and better to state in plain, unmistakable language just what we mean. Therefore, after a free and full discussion of the matter, it was decided that we should recommend a change in the wording of said by-law, by introducing the words *except* and *irregular*, so that the amended section will read as follows:

"Sec. 2. Each County Association shall judge of the qualification of its own members, but as such Associations are the only portals to this Society, and to the American Medical Association, all reputable and legally registered physicians, except those who practice or claim to practice or lend support to any exclusive or irregular system of medicine, shall be entitled to membership."

After what we have already said touching this matter, it may be superfluous to remark further upon our reason for introducing the word "irregular," as above suggested. We will, however, venture to quote the following definitions as they appear in the Standard Dictionary, which, as we all know, is a recognized authority with the courts and with the public:

"Irregular Physician: A medical practitioner not affiliated with the regular profession."

"Regular Physician: A practitioner of the school of medicine that represents the old system, and who is duly authorized as having completed a prescribed course of study according to that school; so-called generally by themselves, but by adherents of other schools usually *allopath*. Compare *allopathy*."

"Allopathy: A system of remedial treatment in which it is sought to cure a disease by superinducing another of a different kind, or by producing a condition incompatible with the disease; a term applied by some homeopaths, and widely in popular use, to the common or 'regular' system of medical practice, to distinguish it from homeopathy."

The dictionary adds a quotation from the "Greyson Letters" as follows: "Neither does it seem quite fair of Hahnemann to charge all other practitioners with uniformly proceeding on some one opposite principle, as allopathy or antipathy; for neither 'homeopathy' nor 'allopathy' was ever heard of till he chose to invent the terms, and, taking one himself, gave the other to all the rest of the medical world."

We submit herewith, with our approval, a form of application for membership, a form for card indices, and a form for certificate of transfer from one County Association to another.

Respectfully submitted,

JOHN R. LEWIS,

Chairman.

.....19..

The undersigned hereby applies for admission to membership in the County Medical Association. He has resided and practiced medicine in the State of Connecticut one year and in said County six months. He does not practice or claim to practice or lend support to any exclusive or irregular system of medicine, and he hereby agrees, if elected, to be bound by the by-laws of said Association.

.....

Name in full.

Recommended for membership by

.....M.D.

.....M.D.

.....M.D.

P. O. address of applicant.....

Name of Medical College and date of graduation

Date of Registration

Name the Examining Board

The Conn. Medical Examining Board.

The Conn. Homeopathic Medical Examining Board.

The Conn. Eclectic Examining Board.

(Please erase the two not used by the applicant.)

The foregoing information is required by the State Medical Society, but each County Association may add to its application blanks such other questions as its best judgment indicates.

CONNECTICUT STATE MEDICAL SOCIETY.

Name Address
 Place and date of birth
 College and date of graduation
 Medical school and date of graduation.....
 Date of registration in County Clerk's Office.....
 Town.....
 Examined by what Board
 Hospital experience
 Present hospital appointments
 Society Membership { Special
 State
 National

CERTIFICATE OF TRANSFER.

This is to certify that.....M.D., a member
 in good standing in the County Medical
 Association, desires to join the County Medical
 Association.

Signed,

.....
President.

Secretary.

Dated, 19..
 at Conn.

[SEAL]

This certificate is valid for only sixty days from date of issue.

DR. O. C. SMITH (Hartford): Mr. President, I think this report has been a clear and concise explanation of this matter. I know Dr. Lewis has spent a great deal of time and thought

upon it. I think it would not be out of place to apprise him of our feeling of gratitude to him for working up this matter so thoroughly. I move that the Secretary express to him the feeling of the House of Delegates in this way. Motion carried.

(16) Report of the Delegates to the American Medical Association, read by Dr. W. H. Carmalt:

REPORT OF THE DELEGATES TO THE AMERICAN MEDICAL ASSOCIATION IN 1907.

Mr. President and Gentlemen of the House of Delegates:

Your delegates to the House of Delegates of the American Medical Association beg leave to make the following report, viz.: Owing to a misunderstanding of the date of the first meeting of the House of Delegates, the delegate for one year was not present on the first day. The delegate for two years was present, however, and both delegates attended all the subsequent meetings. As nearly one-half of the members of the Connecticut State Medical Society throughout the state (i. e., 47 per cent.) are reported by the Secretary of the American Medical Association as taking the *Journal* of the Association, it may be presumed that a much larger proportion of the members of the House of Delegates have the opportunity to read it; and as the *Journal* always publishes, immediately after the annual meeting, the official minutes of the House of Delegates much fuller than we could write them, where all can have the opportunity to read them *in extenso*, it would seem to be superfluous to make an especial report of all that transpired.

Our experience, however, shows certain defects in the manner of procedure of our State Society that we think should be changed. Our annual meeting, coming in the last of May, practically prevents the Connecticut Medical Society from being represented in the working committees of the House of Delegates. These so-called reference committees, i. e., committees to which are referred matters of great interest to the whole profession of the United States, viz.: Medical Education, State and National Legislation and Political Actions,

Hygiene and Public Health, etc., are appointed under the rules by the President at the first meeting of the House of Delegates, immediately following his address. Hence the membership should be known to the President beforehand, in order that he may make his selections with care and deliberation, having consideration of the individual attainments of the members of the committees. If they are only elected by the House of Delegates of the state, as in Connecticut, a few days before the meeting of the House of Delegates of the Association, it is impossible for the President to know in the first place who they are, and in the second place of their fitness for any particular committee, and in consequence this state goes unrepresented and its influence in the working of the business of the Association is practically nothing. Your delegates felt this unfavorable situation immediately, and were not surprised to find that it had been considered in the report of the present as well as in previous committees on organization, inasmuch as they have urged that State Associations hold their meetings in the fall (*vide* p. 21, Minutes of House of Delegates). Having affiliated ourselves so closely with the American Medical Association by our reorganization in 1904, it is desirable that we make that connection as intimate as possible if we are to derive benefit from it. Whether we adopt the suggestion of the committee *in toto* as above, holding the annual convention in the fall, or simply hold an especial meeting of the House of Delegates for the purpose of electing a delegate to the American Medical Association, is a matter for your body to decide; but your delegates of last year feel very decidedly that the change in the time of electing the delegates at least should be made.

If one attends diligently to his duties as delegate, he has but little time to spend in the meetings of the various sections; therefore, the reports of these meetings must be brief and confined to the limited number we were able to attend. One of us was unable to attend but two of the sections, i. e.: Pathology and Physiology and Surgery and Anatomy. In both of these the papers read were of high order. Probably the most inter-

esting feature of the whole programme was a symposium on Exophthalmic Goiter by the three sections of Pathology, Internal Medicine and Surgery. Papers were read by Dr. Beebe of New York, on the Physiology of the Thyroid Gland; by Dr. William G. MacCallum of Baltimore, on the Pathology of Goiter; by Dr. L. F. Barker of Baltimore, on the Diagnosis; by Dr. R. B. Preble of Chicago, on the Medical Treatment, and by Dr. Albert Kocher of Berne, Switzerland, son of the professor of the same name, on the Surgery of Goiter, all of which were most instructive. In the section on Surgery there were a number of papers on ileus, treating of it physiologically as when experimentally produced—post-operative and dynamic ileus; also of symptoms, diagnostic and treatment by Drs. W. B. Cannon of Harvard, R. O. McClure of Johns Hopkins, Frank Martin of the University of Maryland, John C. Munro of Boston, J. D. Roberts of Philadelphia, and William J. Mayo of Rochester, Minn., all of a most interesting character.

Respectfully submitted,

W. H. CARMALT,
D. C. BROWN.

(17) Miscellaneous Business:

DR. FRANK K. HALLOCK (Cromwell): Mr. President, I should like to nominate the following delegates to represent our Society at the International Congress of Tuberculosis, to be held at Washington from September 21 until October 12, 1908: Dr. Seldom B. Overlock of Pomfret, whom the Council has nominated for our President for the coming year; Dr. David R. Lyman of Wallingford, the physician in charge of the Gaylord Farm Sanatorium; Dr. John P. C. Foster of New Haven, one of the Vice Presidents of the National Society for the Study and Prevention of Tuberculosis; Dr. Joseph H. Townsend of New Haven, the Secretary of the State Board of Health and Treasurer of our Society, and Dr. Walter R. Steiner of Hartford, the Secretary of our Society.

On motion the Secretary was instructed to cast a ballot for the first four nominees, while the President cast a ballot for

the fifth nominee, the Secretary. They were, accordingly, declared elected as delegates from the Connecticut State Medical Society.

DR. WALTER R. STEINER (Hartford): Mr. President, I have the following three communications from the New Haven Medical Society:

The committee appointed at the last meeting to consider the advisability of attempting some reform in medical expert testimony would report as follows: We recognize that the present status of medical expert testimony is unsatisfactory. We therefore recommend that this Association urge that a bill be brought before the General Assembly of the state embodying the following features:

1st. That any judge of the Superior Court be empowered in each case involving medico-legal questions to appoint a commission of one or more physicians to act as experts, such appointment to be made upon his own initiative, or upon request of either party to the litigation.

2d. That physicians to be eligible for appointment to such commission should be graduates of some reputable school of medicine and have been in practice a specified number of years.

3d. That the function of such commissions be two-fold: first, to act as medical experts in the usual meaning of that term; second, when requested by the Court to do so, to express an opinion as to the significance of other medical testimony offered in the case.

4th. That such commission be paid by the state.

We further recommend that a copy of this report, if adopted, be sent to the Clerk of the New Haven County Medical Association, with a request that it be there considered with the view of its being brought before the Connecticut State Medical Society at its next meeting, provided it is favorably considered by the County Association.

Respectfully submitted,

JAY W. SEAVER,

EDWIN P. PITMAN,

CHARLES J. BARTLETT, *Chairman.*

The committee appointed at the last meeting to consider the question of privileged communications would report as follows :

There are at present in many of the states statutes making knowledge regarding his patients, which is acquired by a physician either by observation of or by communication by the patient, privileged in courts of law, such privilege being limited to those facts essential for the treatment of the case. There is no such law in this state. It seems to us advisable to attempt to secure a statute making such facts privileged. We therefore recommend that the Secretary of this Association be instructed to communicate this expression of opinion to the Clerk of the New Haven Medical Association, with the request that it be considered at their next meeting, with the object of bringing it before the State Medical Society, provided the County Medical Association considers it favorably.

Respectfully submitted,

JAY W. SEAVER,

E. B. PITMAN,

C. J. BARTLETT, *Chairman.*

The third communication is a request that the dues of Dr. E. B. Heady of Milford be omitted. The doctor was so unfortunate as to break the neck of his femur in 1905. The accident has necessitated his being housed most of the time since then, and has enabled him to attend to but a slight amount of practice.

DR. D. CHESTER BROWN (Danbury): I move the first two communications be referred to the Committee on Public Policy and Legislation. Carried.

It was then moved and carried that Dr. Heady's dues be remitted.

DR. EDWARD P. BREWER (Norwich): At the last meeting of the New London County Medical Association it was voted to remit the dues of Dr. Warren R. Davis for 1907. Dr. Davis is now dead, but he stands on the books with the tax unpaid.

The doctor had retired from practice as a physician some time before his death, and he was not in a financial condition to pay even so small a sum. I move that his tax be remitted. Carried.

DR. GEORGE M. MINER (Waterford): Mr. President, as one of the committee of three from the New London County Medical Association, it is my pleasure to invite the Connecticut State Medical Society to meet with us at its annual meeting in October, provided the State Society holds a meeting at that time.

DR. JOSEPH H. TOWNSEND (New Haven): I move the invitation be accepted, provided we hold a fall meeting. Carried.

DR. EDWARD S. MOULTON: I have two amendments to the by-laws I should like to offer. First to amend Chapter III, Section 1, so as to include the Treasurer among the *ex officio* members of the House of Delegates; and, second, Chapter VII, Section 1, so as to include among the *ex officio* members of the Council the Treasurer. The amended by-laws would then read as follows:

CHAPTER III. HOUSE OF DELEGATES.

SECTION 1. The House of Delegates shall be the legislative and business body of the Society, and shall consist of (1) delegates elected by the component County Associations; (2) the Councilors; and (3) *ex officio*, the President, Secretary and Treasurer of this Society.

CHAPTER VII. COUNCIL.

SECTION 1. The Council shall consist of one Councilor from each county and the President, Secretary and Treasurer *ex officio*. * * *

The other matter which I would like to bring up is the question of reciprocity with other states. Five years ago Connecticut passed a law placing in the hands of the Examining Board the power to join with other states in reciprocity where their requirements were equal to our own.

I have a very high opinion of the requirements of Connecticut, but I don't believe that our requirements are so high that there is no other state which comes up to them. And I also don't believe that our requirements are so low that no other

state will have anything to do with us. I think there are twenty-six or twenty-seven other states in the Union who have reciprocity with other states. Connecticut ought, I think, to take some action in this regard.

During the past year two men of prominence have come to New Haven as members of the Yale faculty, and these men have been obliged to take the examination; and I understand that one of them said he spent a good deal of time in preparing subjects which he had to pass on, which were not in his department. It seems to me this is a narrow position for the state to take, and I would like to make a motion that the Committee on Examinations of the Connecticut Medical Society make some strenuous efforts to bring about reciprocity with those states which have as high requirements as the state of Connecticut.

THE PRESIDENT: You have heard the motion in reference to reciprocity. Any remarks upon that motion?

DR. JOHN W. WRIGHT (Bridgeport): Mr. President, is there not a law concerning this? The Medical Examining Board knows very well that the question of reciprocity lies not so much with our Society as it does with our state in regard to its laws. There are three boards of examiners, if you remember, in this state, and it will be difficult to obtain reciprocity until those three boards of medical examiners can be consolidated into a single board, and thereby the law made a little more like the laws of other states. The subject of reciprocity in connection with other states will probably have to remain about where it is. We have the power, to be sure, of admitting members to this state from other states, but other states will not admit our members into their states so long as we have these three boards as medical examiners. Therefore, reciprocal relations cannot very well be established until these conditions are met. And these conditions must be met by a change in the present laws. I think the Secretary will bear me out in what I say.

THE PRESIDENT: Any further remarks on this matter?

DR. EDWARD S. MOULTON (New Haven): I would say I tried to word my motion in such a way that if the Examining Board found it necessary to amend the laws of the state, that they could bring the matter up, feeling that the board itself were the best committee to attend to this work.

(Dr. O. C. Smith (Hartford) then took the chair.)

THE PRESIDENT: I want to say, when that amendment was passed, it was my impression and the impression of those who were working for it, that the Examining Board for the Connecticut State Medical Society would make use of it in just such cases as the doctor has mentioned. It has seemed to me for a long time, it was absurd to make a man of standing and ability, as are some of the men that come here to New Haven, go through the ordeal of passing that examination. It is what that amendment was made for. I have been very much disappointed that the committee has not made use of it. I think if you change your motion, asking them to make use of that in suitable cases, it will do all that is necessary. We cannot get, as Dr. Wright has stated, reciprocity until we get one examining board. But we certainly can do our part in starting it along, by allowing men to be licensed whom we know to be good surgeons and good physicians, without passing through that ordeal. If your motion was changed so it would simply request them to use that law in suitable cases, I think it would be sufficient for the time being.

DR. EDWARD S. MOULTON (New Haven): Is that broad enough?

THE PRESIDENT: We cannot get reciprocity until we get one examining board.

DR. EDWARD S. MOULTON (New Haven): Wouldn't that come in under this motion? I made the motion that the Board of Medical Examiners of the Connecticut State Medical Society use more strenuous efforts to bring about reciprocity with other states whose requirements are equal to those of the state of Connecticut. Motion carried.

(Dr. McKnight then resumed the chair.)

DR. EDWARD S. MOULTON (New Haven): If that motion is not broad enough, I would like to make another motion, that the suggestion be made to the Examining Committee to use the law they had in cases in which they feel justified of the applicant's eligibility. That covers it, if this motion does not.

Meeting adjourned until the close of the scientific session in the afternoon.

AFTERNOON SESSION, WEDNESDAY, MAY 27, 1908.

The meeting was called to order at 5 P. M. by the President, Dr. Everett J. McKnight. There were present Dr. Oliver C. Smith, Dr. Charles J. Foote, Dr. Edward P. Brewer, Dr. Frank E. Guild, Dr. Edward H. Welch, Dr. Frank K. Hallock (councilors), and Dr. Harry B. Rising, Dr. Edward W. Goodenough, Dr. Charles J. Bartlett, Dr. Edward S. Moulton, Dr. H. Merriman Steele, Dr. Patrick J. Cassidy, Dr. George M. Minor, Dr. D. Chester Brown, Dr. George H. Noxon, Dr. J. Francis Calcf, Dr. Eli P. Flint, the President and the Secretary.

The following report of the Special Committee to consider the recommendations in the report of the Chairman of the Council was read by Dr. Edward S. Moulton (New Haven).

(18) Report of Special Committee to consider the Recommendations in the Report of the Chairman of the Council:

REPORT OF SPECIAL COMMITTEE.

Mr. President and Gentlemen of the House of Delegates:

Your committee appointed to consider the recommendations in the Report of the Chairman of the Council beg leave to report as follows:

1. They recommend the adoption of Sections I and II as read.
2. They recommend that the amendment of the addition to Section 2, Chapter XII of the by-laws be amended to read,

"No physician shall be admitted to or retain membership in the County Medical Associations who has agreed to furnish medical services to any organization or union for a stipulated sum per member or for other consideration than the regular local fee for such services."

3. They recommend the adoption of the fourth section.

4. Relative to the publication of the *Proceedings* of the State Medical Society in the *Yale Medical Journal*, your committee would report that they consider it inadvisable to make a recommendation, but have made the following analysis:

The State Society would benefit by such proceeding: first, early report of the proceedings and papers; second, closer affiliation of the State Society with the County Societies, the individual members and the Yale Medical School; third, a subscription to the *Yale Medical Journal*.

Advantages for the *Yale Medical Journal*: first, it is stated that the publication of the papers of the Society would not be of material value to the *Journal*; second, the *Journal* is guaranteed a circulation of about 950 copies at a subscription price of about \$1.00.

For these benefits the State Society would incur an annual expense of about \$1.00 per member. With the present tax of \$3.00 we could not increase the annual dues but by a four-fifths vote of the House of Delegates (Chapter X of the by-laws).

We would call attention to the provision of our by-laws, Chapter XI, Section 2, which allows the House of Delegates to make any question that they consider of enough importance and general interest a matter of referendum.

5. They recommend the adoption of the sixth and seventh sections, with the suggestion that the Fall Meetings be tried under Chapter IV, Section 3, before any change in the by-laws is made.

EDWARD S. MOULTON,

D. C. BROWN,

H. MERRIMAN STEELE,

Committee.

THE PRESIDENT: Before considering this report Dr. Max Mailhouse desires to speak upon the report of his committee, which the Secretary read, in his absence, at our morning session.

DR. MAX MAILHOUSE (New Haven): I didn't know whether our report was read or not this morning. At the hearing before the Committee on Appropriations in Hartford last summer, the committee felt their efforts very much weakened by the fact that we had no member on Public Legislation in the Legislature, except the President, who opened the hearing, and no appropriation as we should have had.

That is, we feel and have felt ever since, that our efforts should have been forcibly seconded by the united efforts of the Committee on Public Policy and Legislation, and by the aid of the attorney which this committee frequently makes use of, or has the privilege of making use of. Now this matter fell by the wayside, or in other words, the Committee on Appropriations recommended that the matter be referred to the next Legislature. And it is up to this organization now to take it up from that point and see that it is carried through, making a strong effort that it be carried through at the next meeting of the General Assembly.

Now this can only be done if our small committee has, as I said before, the united effort of the Committee on Public Policy and Legislation and its attorney. It takes more than we know how to push a matter of this kind along. It is essential, as we know by our experience in the past, that this bill, which was before the Assembly, go before the Committee on Appropriations very early in the session. That it go there almost, if not among the first, the very first. And for this reason: that during the last session of the Legislature, the money that the state had to expend was practically all gone before this matter was taken up. And if that course of events is always pursued, we will never be able to accomplish anything. It is for this committee, to which I refer, to take this matter up and see that we get a proper hearing, an ably coached hearing, before the Committee on Appropriations, when the matter comes up

again. And I hope that this House of Delegates will take the matter up and take proper action in this direction.

THE PRESIDENT: Gentlemen, I should like to say a few words myself. Any other committee could have used the attorney for the Committee on Public Legislation at any time if they desired. I don't remember the circumstances in this matter. The Committee on Public Policy and Legislation has endeavored to carry out the instructions of the House of Delegates. Whenever they have been asked to do anything, they have done it to the best of their ability. They never have been asked to do anything in regard to this matter by the House of Delegates.

If this committee, which is represented by Dr. Mailhouse, or the House of Delegates instructs the Committee on Public Policy and Legislation to put this bill through, I think it will go through. They never have been requested to do it. A day or two before the hearing Dr. Mailhouse asked me if I would go over there. I did go over there, not as a member of the Committee on Public Policy and Legislation, but as a private individual.

I don't know how it is possible to get a bill through the Legislature with two or three committees running it. I just give this advice to Dr. Mailhouse if he wants that bill to go through; if he wants us to do anything with it, let us take it.

DR. MAX MAILHOUSE (New Haven): All right, you can have it.

THE PRESIDENT: It is very hard to do anything with the Connecticut Legislature if two or three committees take up this bill. I don't know why the attorney was not there. Wasn't he able to be there?

DR. MAX MAILHOUSE (New Haven): I don't know.

THE PRESIDENT: I don't remember the circumstances, but he has always been willing to go any time when he was asked.

DR. EDWARD W. GOODENOUGH (Waterbury): Mr. President, in order that the House of Delegates get itself right in this matter, I move that the Committee on Legislation be empowered and requested to use necessary measures for the

passage of this law which Dr. Mailhouse has requested. Motion carried.

THE PRESIDENT: Now we will take up the report of the committee to consider the recommendations in the report of the Chairman of the Board of Councilors. It would seem to me best to take these up seriatim.

The first recommendation was then read again by the Secretary and accepted. The amendments to the by-laws in this recommendation, as well as in the others, had to lie upon the table for twenty-four hours before being adopted or rejected.

The second recommendation, after being read by the Secretary, was discussed by Dr. O. C. Smith (Hartford), the President, Dr. Charles J. Bartlett (New Haven), Dr. Edward S. Moulton (New Haven), Dr. Frank K. Hallock (Cromwell), Dr. Edward P. Brewer (Norwich) and the Secretary. It was the consensus of opinion that this by-law could not be made retroactive. The recommendation was finally accepted when the clause "after the expiration of his present contract" was interpolated in the proposed by-law, which would then read as follows: "No physician shall be admitted to or retain membership in the County Medical Association, after the expiration of his present contract, who has agreed to furnish medical services to any organization or union for a stipulated sum per member, or for other consideration than the regular local fee for such services."

The third recommendation was adopted without discussion.

The fourth recommendation was then taken up.

DR. EDWARD W. GOODENOUGH (Waterbury): I would like to ask the Treasurer how much our Proceedings cost us now.

THE SECRETARY: About \$1.30 a copy.

DR. D. CHESTER BROWN (Danbury): Is that the entire expense?

THE SECRETARY: Yes, this price includes the delivery.

DR. CHARLES J. BARTLETT (New Haven): The price as given in the proposal, \$2.25, does include the expense of sending out the Transactions.

DR. CHARLES J. FOOTE (New Haven): I don't think it necessarily follows the next two or three years' dues would have to be increased by \$1 each member, a year; for now, as I understand it, there is a surplus in the treasury of \$1,856, and the past year the receipts have increased, this cash on hand has increased \$200, and, apparently, we have a balance in the treasury that is constantly increasing each year. Last year the increase was rather less than it has been previous years, on account of the large expense that was incurred by the Committee on Vaccination, otherwise even more would have been added to this surplus. Consequently it doesn't seem to me it necessarily follows that we will have an increase in dues, certainly not for a year or two, so long as we have this large surplus. I move the recommendation of the Council be adopted.

DR. EDWARD S. MOULTON (New Haven): I would like to make a motion as an individual that this matter be referred to the general referendum, and that a vote of the Society be taken later.

THE PRESIDENT: Dr. Higgins, will you please take the Chair.

(Dr. Higgins then took the Chair.)

THE PRESIDENT: I should like to say this matter came up entirely on my own suggestion. I have felt that as the publication of the Transactions was delayed so late in the year, it would be much better if we could get them earlier. For example, if we could have our Proceedings come along by piecemeal. My attention was first called to it several years ago, when I was delegate to the Pennsylvania State Medical Society. The Secretary there told me that their *Journal* had done more toward building up their Society than any other factor. I feel that it would be a very good thing for our Society. Not necessarily to get the *Medical Journal*, but I believe it has a great many advantages, and should be given careful consideration. If it is not time for it now, wait. The idea of the general referendum has a compromise in it. It doesn't seem to me the matter is of enough importance to war-

rant all that expense and trouble. I shall object to that very strongly. Decide whether we want it now or not, and let it go at that.

I believe it would be an excellent thing in getting men interested in the matters of the Society. The *Yale Medical Journal* would probably publish the Proceedings, the papers read at the County Societies, and some news of the state. Thus there would be a closer union, and of course the *Journal* itself would be managed in an entirely different way from what it is run at the present time.

DR. EDWARD S. MOULTON (New Haven): I would make a motion to lay that over for a year, in order that the delegates get a chance to consult the County Associations.

DR. EDWARD W. GOODENOUGH (Waterbury): This matter comes up to vote that we should try it for three years. We have been told by Dr. Foote that really, certainly for two years, from the amount of money in the treasury, there will be no apparent additional expense. The probability consequently exists that for three years we can do this without any additional expense to the Society.

What harm is there, then, in our trying it and beginning this trial now? I can see no reason against it, certainly so far as any benefit that the *Yale Medical Journal* gets, is concerned. I feel very sure everyone in the state who is interested in the practice of medicine is willing to assist the *Yale Medical Journal*, for the *Yale Medical Journal* assists us and assists our Association. I believe that is its purpose, and they certainly will aid us to the best of their power. At the end of three years, if we don't wish it, then we can drop it.

DR. WILLIAM L. HIGGINS (South Coventry): Motion for adoption of recommendation of Council as it was originally given.

DR. EDWARD S. MOULTON (New Haven): I don't want to dispute Dr. Foote, but the Treasurer told me this morning if this thing was adopted it would probably increase the annual dues at least a dollar. That is from the Treasurer's point of view.

DR. CHARLES J. BARTLETT (New Haven): The proposition was made on the supposition that the *Journal* could be sent out as second class mail matter. Some minor changes may be necessary in order to comply with that. And if this motion is carried, I should like to have it with the understanding that the committee of the State Society will have authority to act with the editors of the *Journal* in making such minor changes as may be necessary in order to comply with the requirements of second class mail matter.

DR. EDWARD P. BREWER (Norwich): From a business point of view, I see but one fault in this proposal that is submitted; that is, the increased pages shall be paid for *pro rata*. Now we may double the size of our Transactions and double the expense. It would seem as if some provision should be made for that. The Secretary or President should have the power to edit the paper so that the Transactions shall not be larger than at present, so as to guard against a large increase in the expense and the general tax upon the Society.

DR. O. C. SMITH (Hartford): That is provided in the motion, the Secretary edits the Transactions.

DR. FRANK K. HALLOCK (Cromwell): It is very unlikely that the size will be increased for several years, unless the size of the Society is increased very rapidly.

DR. EDWARD W. GOODENOUGH (Waterbury): I think if we follow the Proceedings from the time when the present Secretary took hold of it, we shall not be worried about any great change in the price of the Proceedings.

THE SECRETARY: I might say that the Proceedings vary for different years. Last year, as you remember, Dr. Bacon was prevented from reading his paper by the illness of his father; yet he gave, extempore, a short account of what he would write, and he did write an extensive paper, which we published entire. Then in addition to that I made one departure last year from the rule that no county paper would be published, and I made that for this reason: Dr. Miner C. Hazen had written a paper on Dr. Phineas Fisk, an old clerical physi-

cian of Haddam, which he read before his County Medical Association. I published this in the Transactions, as I wished to place it on record there along with other papers of that nature which have appeared in past Transactions.

DR. EDWARD P. BREWER (Norwich): What size volume do they figure upon? How many pages this year?

THE SECRETARY: Similar to 1907.

DR. EDWARD W. GOODENOUGH (Waterbury): It is true, isn't it, that the Proceedings are very much less cumbersome since the matters of the County Societies were dropped?

THE SECRETARY: Very decidedly.

DR. WILLIAM L. HIGGINS (South Coventry): Do you wish to discuss the motion further? Do you all understand the motion?

DR. EDWARD S. MOULTON (New Haven): It seems to me we have got a very small number here to decide this matter. We have got a bare quorum. It is an important matter. I think it is a mistake to take this important action. I move that this matter lie on the table, to be taken up again to-morrow morning.

DR. PATRICK CASSIDY (Norwich): Mr. President, we have decided a very important matter, the matter of contract work, with a bare majority, a bare quorum. I don't see any reason for putting over this matter until to-morrow morning, when some of us will not be here.

DR. O. C. SMITH (Hartford): I would like to ask if there is any other objection, except the expense?

DR. EDWARD S. MOULTON (New Haven): Simply the financial side of it; that the dues of the Society have been going up, and we have had to expel a number of men. A number of men who have a small practice find it difficult to pay our dues. The local Society here has doubled its dues recently, and the expenses going up make it very hard on that class of men.

DR. O. C. SMITH (Hartford): I should like to say the difference between \$1.30 and \$2.25 is 95 cents.

DR. CHESTER BROWN (Danbury): Is it worth it, for getting our Proceedings published twice?

DR. O. C. SMITH (Hartford): I should like to say to anyone in my county who doesn't feel able to bear it, I should like to pay it for them. It is the *Yale Medical Journal*; it will have the Proceedings published promptly. Time goes on so rapidly that the papers sometimes lose their force when they are published. Ninety-five cents a year seems to me so small a matter that it does not seem to me that this expense ought to stop us, if it is desirable for the professional interests of this Society to carry this through.

DR. WILLIAM L. HIGGINS (South Coventry): The motion is to lay this matter on the table—it seems to me the motion is lost. Is it doubted? Will you remark further upon the motion of Dr. Foote? I am afraid it is not sufficiently clear in my mind. Will Dr. Foote repeat it?

DR. CHARLES J. FOOTE (New Haven): I move the recommendation of the Council regarding this matter be adopted.

DR. WILLIAM L. HIGGINS (South Coventry): I think the ayes have it. It is so voted.

(Dr. Everett J. McKnight then resumed the Chair.)

The fifth recommendation of the Special Committee was adopted without discussion.

The amendment proposed by the report of Dr. John B. Lewis, as well as those proposed by Dr. Edward S. Moulton (New Haven), were laid on the table, to be acted upon on the following day. Dr. Moulton's amendments were discussed by the Secretary, Dr. Edward S. Moulton (New Haven), Dr. Frank K. Hallock (Cromwell) and Dr. Charles J. Bartlett (New Haven).

Dr. Charles J. Bartlett (New Haven) moved that the by-laws be so amended that the two Vice Presidents and the Treasurer be made *ex officio* members of the House of Delegates. This would amend Chapter III, Section 1, so that it would read: "The House of Delegates shall be the legislative and business body of the Society and shall consist of (1) dele-

gates elected by the component county associations; (2) the Councilors; and (3) *ex officio*, the President, the two Vice Presidents, the Secretary and the Treasurer of this Society."

(19) Report of the member of the National Legislative Council, Dr. William L. Higgins (South Coventry) :

REPORT OF THE MEMBER OF THE NATIONAL LEGISLATIVE COUNCIL.

Mr. President and Gentlemen of the House of Delegates:

The Annual Conference of the Committee on Medical Legislation and National Legislative Council was held December 10, 1907, in Chicago.

Through some oversight, my appointment was not made until after this meeting was held, therefore, much to my regret, I did not attend.

However, through correspondence with its Secretary, I have been kept informed of its work and plans. By way of remembrance, I will state briefly some of the objects sought and in which it has the support of more than ninety lay and professional organizations scattered throughout the United States.

1. To combat all forms of quackery and charlatanism.
2. To prevent food adulteration and drug substitution.
3. To prevent the sale of narcotics and alcohol disguised as patent medicines.
4. To prevent the circulation of indecent medical advertisements.
5. To advocate the establishment of a National Department of Health.
6. To carry on an educational campaign for the spreading of accurate knowledge concerning the public health and the inculcating of higher health ideals.
7. To protect the public health by assisting the constituted authorities in the enforcement of existing laws, and by urging the enactment of uniform legislation in all the states on matters relating thereto.

8. To coöperate with other societies interested in any public health problem, and ultimately to effect a plan of union or coöperation of all organizations interested in the public health.

I have been requested to urge upon you the necessity of becoming active in an effort, first, to secure the attendance of as many physicians as possible to the State and National Conventions of the respective parties; second, to secure the adoption of a plank in the respective platforms declaring for the organization of all existing national public health agencies into a single National Health Department, with such improved status, increased power and adequate financial support as will give to the Federal government the strongest and most efficient control of all national public health interests; third, to secure the candidacy of as many physicians as possible for election to both branches of both the State Legislature and the Congress.

There were 105 physicians in the recent Ohio State Republican Convention, and perhaps it is needless to say that a plank favoring the proposed National Department of Health was adopted, the first time, it is believed, that such a movement has been taken up as a party measure.

In closing I wish to suggest that in the future the Chairman of our Committee on Public Policy and Legislation be appointed the member for our state on the National Legislative Council, and that the Auxiliary Committee be composed of the members of the Committee on Public Policy and Legislation. The reasons for this course are so apparent that I need not enter into them at this time.

I would further suggest that this Society express its views through some properly appointed committee in regard to the propriety of addressing the delegates from this state to the several National conventions and urging them to support a health department plank in the platform of their respective parties.

Respectfully submitted,

WM. L. HIGGINS.

DR. WILLIAM L. HIGGINS (South Coventry): I would suggest that the \$20 usually paid the member of the National Legislative Council for the expenses to the Chicago meeting be appropriated to print an address favoring a National Department of Health, and that this be sent to the delegates to the Republican and Democratic State Conventions.

Dr. Higgins' report was accepted.

DR. J. FRANCIS CALEF (Middletown): I move the Chair appoint a committee of three to draft resolutions to be sent to the delegates to the State political conventions, and that they should not incur an expense to exceed \$30.00. Carried.

The President subsequently appointed Dr. William L. Higgins (South Coventry), Dr. Phineas H. Ingalls (Hartford) and Dr. Charles J. Foote (New Haven).

Meeting adjourned to meet again Thursday morning at 9 A. M.

MORNING SESSION, THURSDAY, MAY 28, 1908.

The meeting was called to order at 9 A. M. by the President, Dr. Everett J. McKnight. There were present Dr. Oliver C. Smith, Dr. Charles J. Foote, Dr. Gould A. Shelton, Dr. Frank E. Guild, Dr. Edward H. Welch, Dr. Frank K. Hallock (counselors), and Dr. Edward R. Lampson, Dr. Harry B. Rising, Dr. Edward W. Goodenough, Dr. Charles J. Bartlett, Dr. Edward S. Moulton, Dr. James H. J. Flynn, Dr. H. Merriman Steele, Dr. John F. Hayes, Dr. Patrick J. Cassidy, Dr. George M. Minor, Dr. George H. Noxon, Dr. Frank W. Stevens, Dr. Ralph S. Goodwin, Dr. Robert Hazen, Dr. J. Francis Calef and Dr. Eli P. Flint (delegates), the President, Dr. Everett J. McKnight, and the Secretary, Dr. Walter R. Steiner.

The readings of the minutes of the session on the previous day were read and accepted.

THE PRESIDENT: The election of officers is the first order of business. I shall ask the Secretary to read the list of nominees made by the Council, the Nominating Committee.

The Secretary then read the list (see page 18).

DR. EDWARD W. GOODENOUGH (Waterbury): I move that the Secretary be empowered to cast a single ballot for the officers nominated. Carried, there being no other nominations.

The list of nominees, as read, were then declared elected.

DR. FRANK K. HALLOCK (Cromwell): Referring to the recommendation in the report of the delegates to the American Medical Association, I should like to nominate, at this time, Dr. D. Chester Brown of Danbury to succeed himself a year from now, if he will take the position. The reason for this is, it is extremely desirable for the delegates to the American Medical Association to remain in office a reasonable length of time. It is very much desired that this rule be followed. If Dr. Brown will continue to serve I think he should be retained. I should like to nominate Dr. William H. Donaldson of Fairfield as alternate. They were then, on motion, declared elected.

The next order of business was the consideration of the amendments, which had lain on the table from the previous day. The first amendment would alter Chapter XII, Section 2, to read as follows:

CHAPTER XII.

SECTION 2. Each County Association shall judge of the qualification of its members, but as such Associations are the only portals to this Society and to the American Medical Association, all reputable and legally registered physicians, except those who practice or claim to practice or lend support to any exclusive or irregular system of medicine, shall be entitled to membership.

The change or amendment consisted in the clearer definition of those who were entitled to membership, by the words "except" and "irregular." The amendment was adopted without discussion.

The second amendment, which was a paragraph to add to Section 8, Chapter XII, was then read. It read as follows:

In the case of death, illness or disability of a councilor or delegate, the President of the County Association in which the vacancy occurs shall appoint a substitute councilor or delegate, with full power to represent his county during the councilor's or delegate's disability, or

until the successor of such appointee is elected, at the next meeting of the County Medical Association.

The amendment was adopted without discussion.

The third amendment was designed to be added to Section 2, Chapter XII. It read as follows:

No physician shall be admitted to, or retain membership in, a County Medical Association, after the expiration of his present contract, who has agreed to furnish medical services to any organization or union for a stipulated sum per member, or for other consideration than the regular local fee for such services.

The following discussion upon this amendment then ensued:

DR. EDWARD H. WELCH (Winsted): Mr. President, I wish to state, as I stated in my report from Litchfield county, I do not think we are quite prepared for such drastic measures. After our last meeting in Hartford I talked with several of our members, and it is well for you all to understand that it is going to reduce our membership in Litchfield county quite materially, and I understand in other counties. I presume that we will have in Winsted the same trouble they had in Waterbury; they will import men to do contract work. Just at present it seems to me the most pernicious of all the contracts that has been perpetrated is that of the Order of the Eagles. The order has, I think, 125 members. They are in Winsted, and a member of our Society, the County Society, had taken a contract from the order. Of course I am sure that he won't hold it beyond this one year, but it means others will get the contract. He gets, as I understand, \$1 apiece for examinations, and his contract, as I have been told, reads for \$2.50 a head; he not only doctors each member of the association, but their families, and he has to do what surgical work is required. He only drew the line on obstetrical work.

Now, gentlemen, personally I feel very much in favor of this amendment, but we are a small membership up there compared to some counties, and it seems to me that we better look at it in the face of our finances; and, as you say, the County Association is the only way to get into the State Society and into the American Medical Association, let us consider whether we want to go as far as this now.

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DR. EDWARD S. MOULTON (New Haven) : On account of Dr. Welch's remarks, I would like to make the motion that this amendment be laid on the table for one year, and that the members of the Council be instructed to bring this matter up at the meetings of their County Associations, and ask the Associations to instruct their delegates as to how they would like to have them vote. Motion seconded, but was lost when the President put the motion.

DR. RALPH S. GOODWIN (Thomaston) : I would like to ask a question. We have a system in Thomaston, where I come from, which I understood, when I came back to Litchfield county practice, was the system all over the county. I find, from Dr. Welch's remarks, it isn't so. We established a system a few years ago where any physician may doctor for any lodge in the town, but he renders his bill just the way he would do to an individual, itemizing it, and gives the lodge a discount for cash payment. And in that way we consider that every man has just as good a chance as another man. There is no contract with the lodge, although the lodge goes through the form of appointing different members of the medical profession as their lodge physician, and conform to their by-laws. When the quarter is up he renders a bill just like the druggist does, or any other person who has dealings with a lodge, and gives them a discount for cash. And we consider it a very good method, and the lodges have been more successful there than they have been in other towns where they have contracted for so much a head. They have been laying up money, and they have considered that that cost them a little bit more than the other way, but they were very well satisfied with it.

It seems to me it would be well if an amendment can be made to this amendment so that this system can be allowed. I should like to ask the question whether, if this amendment goes through, we should be allowed to continue that way in our town?

DR. O. C. SMITH (Hartford) : I don't think that is a contract, sir ; he makes his calls and charges as he would

anyone. The matter of discount is a matter to be left to his judgment at the end of the time. This, I don't think, would interfere with that work.

THE PRESIDENT: The Chair would say that is the same position that the medical life insurance companies, or those who are doing work on our railroads, are in, who, when they make their bill out for services rendered, allow a small discount for cash for getting their pay from the road instead of the employees, a great deal of which they would lose. The Chair would rule that this vote would not interfere with that kind of practice.

DR. PATRICK J. CASSIDY (Norwich): I should like to ask Dr. Goodwin if there is any stated rate of discount?

DR. RALPH S. GOODWIN (Thomaston): Yes. All the physicians recognize that they allow thirty-three and one-third per cent. discount to all the lodges; all of them are included just the same, whether it is a large lodge or small lodge, or anything of that kind, we treat them all the same.

THE SECRETARY: I was amused at Dr. Lewis' interpretation of one of the sections. I asked him about contract work. He, as you know, is medical director for the Travelers, and has had great experience. He said if the Society didn't want to put anything in their by-laws concerning it, he should think this might cover it. In the qualifications for membership, Chapter 12, Section 2, it speaks of every reputable and legally registered physician. Dr. Lewis says that those who do contract work are not reputable.

DR. PATRICK J. CASSIDY (Norwich): We have a great deal of trouble in our county, especially in the county seat of Norwich, with what is called contract work. We have one man who is a very reputable man in every way, but for the fact that he does do contract work. I spoke to him on the subject, and he told me that he didn't do contract work, he had no contracts. He has no contracts, it is perfectly true. He renders a bill every quarter, counting up the members of the lodge, and renders a bill for each man, at a specified rate, and deducts from that bill, and he gets a cash payment. Of course, under the amendment

to the by-laws, he is still in good standing with the Society, but really he is having a contract.

We have other men who have no written contracts on mill people. And I think the idea of allowing a man, a member of our Association, to render a bill quarterly and to deduct out a specified rate, an understood rate, is not to be considered for one moment. If a man wants to deduct, of course it is a question between himself and his patient. But I should not think there ought to be a specified rate of deduction, because it is really beating about the bush with this question of contract work. If men who do contract work have no written contracts, but understood contracts, then the situation will be left in the same condition in which we were before the adoption of this amendment.

DR. J. FRANCIS CALEF (Middletown): In the case which Dr. Cassidy speaks of, the doctor presents practically a bill for services unrendered. That is to say, he presents a quarterly bill for every man. That, I think, would come easily under the desirable proposed amendment to our by-laws. He presents a bill for every man of the lodge quarterly, whether he may have rendered an hour's services to that man or not. Dr. Goodwin gives to us a basis of services in every item of the bill rendered. I would say we might very well exclude the class of cases Dr. Cassidy speaks of, and still retain the class of cases Dr. Goodwin speaks of.

The amendment was then adopted.

Dr. Moulton's proposed amendments to Section 1, Chapter III, and Section 1, Chapter VII, were then considered. They were as follows:

CHAPTER III.

SECTION 1. The House of Delegates shall be the legislative and business body of the Society, and shall consist of (1) delegates elected by the component County Associations; (2) the Councilors; and (3), *ex officio*, the President, Secretary and Treasurer of this Society.

CHAPTER VII.

SECTION 1. The Council shall consist of one Councilor from each county and the President, Secretary and Treasurer *ex officio*.

The proposed changes were the making of the Treasurer an *ex officio* member of the Council and the House of Delegates.

The first amendment was rejected when it was put to vote by the President, and the second was withdrawn by Dr. Moulton, as the proposed change was also in Dr. Bartlett's proposed amendment.

Dr. Bartlett's proposed amendment to Section I, Chapter III, was then taken up. It was as follows:

CHAPTER III.

SECTION I. The House of Delegates shall be the legislative and business body of the Society, and shall consist of (1) delegates elected by the component County Associations; (2) the Councilors; and (3), *ex officio*, the President, the two Vice Presidents, the Secretary and the Treasurer of the Society.

The proposed changes were to make the two Vice Presidents and the Treasurer members, *ex officio*, of the House of Delegates. This amendment was adopted without discussion.

DR. FRANK K. HALLOCK (Cromwell): Mr. President, I move the tax for the ensuing year be \$3. Carried.

DR. FRANK K. HALLOCK (Cromwell): I move that our next annual meeting be held at Hartford, on the fourth Wednesday and Thursday of May, 1909. Carried.

DR. EDWARD S. MOULTON (New Haven): I move that the report of the Committee on Public Policy and Legislation upon the communications from the New Haven County Medical Association, concerning privileged communications and expert medical testimony, be postponed until the next annual meeting. Carried.

The taxes of Dr. Charles R. Hart of Bethel and Dr. Edwin A. Bidwell of Deep River were remitted upon motion of Dr. Frank W. Stevens (Bridgeport) and Dr. J. Francis Calef (Middletown).

DR. EDWARD W. GOODENOUGH (Waterbury): I move that this present House of Delegates instruct the Committee on Public Policy and Legislation to do all in their power to accomplish the necessary legislation for the passage of those meas-

ures mentioned in the first two communications from the New Haven County Medical Association. Carried.

DR. CHARLES J. BARTLETT (New Haven): I move that the committee which has made the arrangements with the Advisory Board of the *Yale Medical Journal* be the committee to complete the financial arrangements, with power to act and make such alterations as were suggested yesterday in our discussion of the question. Carried.

The House of Delegates then adjourned.

The Banquet.

The annual banquet was held at University Hall, on Thursday evening, May 28, at 7.30 P. M. One hundred and ten members of the Society were present. Dr. Henry L. Swain acted as toastmaster. The following were the speakers:

GOVERNOR ROLLIN S. WOODRUFF,
MAYOR JAMES B. MARTIN,
PRESIDENT ARTHUR T. HADLEY,
DR. EVERETT J. MCKNIGHT,
REV. STEWART MEANS,
FATHER EDWARD DOWNS,
COL. N. G. OSBORN,
DR. EDWARD H. JENKINS.

PRESIDENT'S ADDRESS.

The President's Address.

EVERETT J. MCKNIGHT, M.D., HARTFORD.

In accordance with an established custom, and by virtue of the office which I bear, I have the honor of addressing you at this, the one hundred and sixteenth annual meeting of the Connecticut State Medical Society, and of extending to you, her members and guests, her cordial greetings and hearty congratulations upon the peace, harmony and prosperity which at present pervade the professional life of the state. In addressing you to-day I shall take up the consideration of certain matters involving the relations of the medical profession to the health and prosperity of the state and nation, which, though not strictly political in character, will be grouped under the heading of "Medical Politics."

In his address before this body a year ago, my immediate predecessor stated in substance that it was the duty of members of the medical profession, who were not dependent upon their professional work for the support of themselves and a growing family, and had gotten along to the age of forty-five or fifty, to seek public office, or at least to be prepared to discharge the duties of such office if the opportunity presented itself. I am certain that it was not his intention to advise that such persons should continue long in such capacity, nor allow their incumbency of such office to interfere with their professional duties, except for the time being. The statement that a man of fifty years of age in our profession can bring a rich fund of experience to any office of a public nature to which he may aspire, is one which cannot be controverted; and yet the question arises, whether this same training and experience would not enable such a man to accomplish more, for the good of his country and his fellow-men, by continued applica-

tion and development along professional lines, than by devoting a part of his energies to the performance of the duties of a public office. Medicine and surgery have so nearly approached to exact sciences, that we cannot believe that the men of middle life now most actively engaged, will become antiquated or considered as having passed their period of usefulness in the practice of medicine at fifty, sixty or even seventy, provided "*mens sana in corpore sano.*"

The charms and emoluments of public life may rightly allure a few members of the profession to take up this work, but for any number of medical men to enter the field of state or national politics, thereby depriving themselves and the communities in which they live of the advantage of their training and ripe experience, would be most reprehensible. It has been claimed that a physician can dabble in politics without losing his identity as a practitioner or interfering with his usefulness in the profession. While there are notable exceptions, the rule still holds good that no man can serve two masters.

In this connection I cannot refrain from calling attention to the fact that a position in the medical department of a prosperous life insurance company, carrying with it a guaranteed income with no personal outlay, is an alluring proposition, but that such a position requires so great an expenditure of interest and energy that with few exceptions it greatly detracts from full and complete professional development. It is advisable, however, that every busy physician have some hobby—something to think about outside of his professional duties, a sort of safety valve to relieve his overtaxed mind and nerves; yet, if he is to fulfill his full mission in life, such outside indulgence should be secondary to his professional duties, and should aid rather than hinder him in his work.

Leaving the field of politics, so-called, there are matters of public policy of vital importance to state and nation which it is the duty of every physician to carefully consider. Never before in the history of medicine has there been a time when so great responsibility as regards the health and prosperity of the people of this country has rested upon the medical pro-

fession. Our ancestors, not having found the hidden causes of disease, nor learned the methods for its prevention, were limited to attempts to cure the diseases of their patients. To-day the causes of nearly all the diseases peculiar to man are known to every intelligent practitioner, as well as in the majority of cases the means by which they can be prevented.

How great then is the responsibility which rests upon every one of us, and how negligent are we of our duty, if we do not use every possible influence to prevent disease, not only in the families under our immediate care, but, through the enactment of adequate laws, to preserve as far as possible the health and welfare of the people of the nation. Unlike conditions which exist in other occupations, it has become the duty of the physician, entrusted as he is with the lives and health of a portion of his community, to prevent without recompense diseases which, if allowed to materialize, would be greatly to his financial advantage.

For many years the medical profession throughout the civilized world has, unrewarded, been doing an immense amount of work in this line which should have been carried on under governmental direction and control. In any line of work, those to be benefited thereby should pay for the service rendered; so laborers in the field of investigation of the causes and prevention of disease should receive their remuneration from the citizens of the nation, through the national treasury; and the government should foster and stimulate such investigation, by the establishment and maintenance of suitable laboratories, and by recognizing in some tangible way the discoveries of private investigators.

During the five years ending December 31, 1907, there was expended by the Public Health and Marine Hospital Service, for quarantine service and preventing the spread of epidemic diseases, the sum of \$2,449,897.15; to which should be added \$43,885.42, the amount already expended under the act of June 19, 1906, appropriating \$500,000 for establishing quarantine stations, and preventing the importation of yellow fever and other quarantinable diseases and other purposes; and

\$8,443.02, the amount expended so far towards the buildings, equipment and maintenance of a leprosy hospital in Hawaii, for the investigation of leprosy, under the act of March 3, 1905, appropriating \$150,000 for that purpose. An appropriation of \$75,000 under the act of March 4, 1907, for additional buildings in connection with the Hygienic Laboratory, cannot be considered as money expended during the five years in question, as no use was made of the same during that period.

During the same five years, ending December 31, 1907, there had been expended by the government for "scientific investigations relative to the causation of animal diseases and methods of combating them," "inspection and quarantine of imported animals and investigations relative to the existence of contagious diseases," and "eradication of contagious diseases through slaughter of animals, disinfection of animals and premises, and supervision of movement of animals from infected districts," the sum of \$2,512,206.47. These figures are taken from a special report recently received from the Secretary of the Department of Agriculture, who stated that, "During the last six or seven years the Department has eradicated foot-and-mouth disease among cattle and *maladie du coit* among horses, and has vigorously prosecuted the work of stamping out scabies among sheep and cattle, and in the last year has begun active work for the extermination of the southern cattle tick."

On February 20 of this year, the House Agricultural Committee agreed to increase the appropriation for fighting the gypsy and browntail moths in New England from \$150,000 to \$250,000, and to appropriate \$250,000 for the extermination of the Texas cattle tick.

In a matter so complicated, in which so many departments are interested, it is difficult to get at an exact comparison; but, from a careful examination of reports from the various departments, we can safely say that there has been expended by the United States government during the five years ending December 31, 1907, for the prevention and eradication of diseases in animals, about \$19,000 more than for the same purposes in

the human beings under its control. It must be taken into consideration that a considerable part of the expenditures of the Public Health and Marine Hospital Service, in connection with this work, were for services and work done outside of the United States—as, for example, out of the sum of \$117,649.97 expended in 1907 for preventing the spread of epidemic diseases, \$83,570.53 was for work done in China, Japan, Italy, Central and South America, West Indies, Panama and Canal Zone, Cuba and Mexico, for foreign medical service, salaries, subsistence, supplies and miscellaneous. On the other hand, we must not overlook the fact that the prevention of certain diseases in animals tends to lessen the occurrence of the same in man. We can safely say, however, that the United States government has for years, and still is expending more for the preservation of the health of its domestic animals than for the people dwelling within its borders. The explanation of this I think is obvious. Large sums of money have been invested in the raising of animals and their preparation for food for residents of this country and for exportation to foreign lands. The attention of our lawmakers has been so forcibly drawn to this matter that they have felt obliged to take all possible measures to eradicate diseases peculiar to animals. On the other hand, I believe that the physicians of this country, to whom has been entrusted the health and lives of the people, have been very negligent in the past in not bringing these matters before our national legislative bodies in their true light. If the government has been tardy in enacting laws and making appropriations for the prevention of disease and the preservation of the health of its subjects, it is mainly because the medical profession has not brought these matters to its attention with the same vigor and determination that has been done by those whose capital has been invested in our animal industries. This is not on account of ignorance on the part of the profession, nor because its attention has not been called to the importance of those matters.

In 1889 the now venerable Dr. George L. Porter of Bridgeport, at that time the President of this Society, delivered a

most eloquent and scholarly address upon this subject, in which he showed the cost of sickness to the individual and to the state. "In 1880 there were reported 91,270 deaths from consumption—which was the largest number of deaths from any single disease—and the mean age of death was the thirty-seventh year, when a healthy person is at about the maximum of mental and physical vigor; therefore, if the loss by consumption in people is estimated as the loss in cattle by the same disease would be, it amounted in that single year to more than \$456,000,000, and for the total deaths more than \$3,784,000,000. Accepting these estimates of value, the total cost to the United States of sickness among the people, and the loss by death, including loss and expense to the individual, the loss to the state in productive and personal value as citizens, amount annually to more than \$5,274,000,000." I shall always remember with what surprise and interest I listened to that address, and yet neither have I, nor so far as I know has any one of the members of this Society, brought the matter forcibly to the attention of our representatives in Congress during the nineteen years which have intervened.

Soon after the beginning of the Civil War, Governor Buckingham of this state appointed a military commission to select surgeons for the Connecticut troops from among the physicians of the state. Dr. Gurdon W. Russell of Hartford, now in full possession of his mental facilities in his ninety-fourth year, was made chairman of the board. On November 21, 1887, at the completion of his fiftieth year of active service in the profession, the Hartford City Medical Society presented to Dr. Russell a loving cup. On that occasion the late Dr. Melancthon Storrs, in relating his experiences before the military commission, stated that the chairman questioned him mainly about fevers. "I knew very little about fevers. My mind had been running in other directions. I could have told him how to dress wounds, how to ligate the arteries, and how to perform the various amputations, and so it was very unfortunate to ask me about fevers, for the more he inquired the less I knew. It did not tend to bring me out to advantage.

What did I care for the fevers? I saw the hosts mustering for the battle. I heard the drum-beat, the cannon's roar, the groans of the wounded, and the shrieks of the dying. . . . I did go, and in the four following years I learned, first, that Dr. Russell was quite right to question me about the fevers. For I struck the fever when I reached the camp, had it in all our marches, in all our encampments, and even on the battle-field. In all of our marching and countermarching for the four years, we could have lined our way by the graves that we made for the fever. The chairman of that commission knew that the sword would claim its thousands, but the fever its tens of thousands." There were present at that meeting a large number of the most prominent and influential physicians of the state, and yet, during the late war with Spain, it was evident that these words had not borne fruit, because they had not been transplanted upon the fertile soil of popular opinion, nor been engrafted upon the minds of those who dictated the affairs of the nation. It remained for the inhabitants of a little isle of the sea, scarcely more than half a century emerged from barbarism, to demonstrate to the civilized world that the decimation of armies by fever was absolutely preventable.

It is only a repetition of the old story of that which is everybody's business is nobody's business; and, as a result, thousands of unnecessary deaths have occurred, entailing an incalculable loss upon the family, the state and the nation. It is a singular fact that the people themselves, those who would be most benefited by laws regulating health and preventing disease, have never asked for nor demanded the enactment of such laws. In fact, they, the masses, have been most active in hindering us in our attempts to regulate and elevate the practice of medicine in this state, and in our endeavors to keep upon the statute books and enforce existing laws regulating disease.

This condition of affairs is not to be wondered at, when we look back thirty or forty years, and recall the bickerings and dissensions which existed between the representatives of the different schools of medicine, and often among members of the

same school—even that one from which we are proud to say that our present magnificent organization has been evolved. We certainly cannot criticise the laity for lack of confidence in the suggestions and teachings of a body of men in which such diverse opinions and such strife and discord prevailed. Fortunate is it for humanity that the old order of things has passed away, and that we stand to-day an almost united band, working together, not only to prevent and cure the maladies of our patients, but, imbued with charity toward all, to lend the helping hand to our professional brethren when in need.

The effect of this change in the attitude of the profession, aided by the results of scientific research, has been to start in motion a mighty wave of popular interest in matters pertaining to the preservation of health and the prevention of disease, which must be of incalculable advantage to the happiness and material prosperity of the race. The brilliant achievements of the past few years should stimulate to greater activity, and it remains for the members of the medical profession to continue their labors, and for each and every one to become politicians in the true sense of the word. Whatever may have been said to the contrary, I believe it to be the duty of every medical man to take an active interest in the political affairs of his town, state and country. "Some have said that it is not the business of private men to meddle with government—a bold and dishonest saying, which is fit to come from no mouth but that of a tyrant or a slave. To say that private men have nothing to do with government is to say that private men have nothing to do with their own happiness or misery; that people ought not to concern themselves whether they be naked or clothed, fed or starved, deceived or instructed, protected or destroyed."

We should all endeavor to secure the nomination and election to official positions of men of undoubted integrity, and should see to it that they are familiar with the immense loss to which the country is subjected each year, through sickness and death, from diseases which might easily have been prevented. They should be made to understand the necessity for the establishment and maintenance by the government of research labora-

tories, and for some practical recognition of the work of private investigators. We should not cease in our labors until there shall be a medical man in charge of the Department of Health in our national cabinet, to watch over and conserve the health of our citizens; who, when war-clouds hover, shall so work in harmony with his military brethren that the nation may be spared the humiliating disgraces of the past.

The present crusade against tuberculosis should be fostered and encouraged as well as the various attempts by the different leagues and committees toward the enactment and enforcement of laws relating to health and preventing disease.

We should all remember that the great achievements of modern medicine and surgery would have been impossible without the existence of organized bodies of medical men, where important discoveries could be reported and discussed as well as other matters of interest to the profession. We can hardly estimate the benefits which the physicians of this state have derived from the one hundred and fifteen meetings of the Connecticut State Medical Society which have preceded this, nor the value in dollars and cents to the state from the resulting decrease in sickness and mortality. It should be the policy of every member of this Society to give her the benefit of his support, to the extent to which he is qualified, and above all to remember that contention and discord should never be allowed to enter into her deliberations. Only by harmonious action can we gain the respect and confidence of the laity, and overcome the opposition of those misguided individuals who are so assiduously endeavoring to obstruct us in our efforts to elevate the standard of medical education and to secure the enactment of laws necessary for the preservation of health.

I am addressing to-day a body of men the sum of whose influence in the communities in which they live is so great, that by united action they could control the policy of the state. This was evidenced when a year ago, by concerted action, you so badly defeated those who were strenuously endeavoring to efface from our statute books the present laws relating to vaccination.

It is for you to determine how this influence shall be used; see to it that those occupying prominent positions in our legislative bodies, who for political advancement would repeal existing laws necessary for the preservation of the health of our citizens, feel your power.

“A weapon that comes down as still
As snowflakes fall upon the sod;
But executes a freeman's will,
As lightning does the will of God;
And from its force, nor doors nor locks
Can shield you; 'tis the ballot-box.”

“In our country and in our times no man is worthy the honored name of statesman who does not include the highest practicable education of the people in all his plans of administration. He may have eloquence, he may have knowledge of all history, diplomacy, jurisprudence; and by these he might claim, in other countries, the elevated rank of a statesman: but unless he speaks, plans, labors, at all times and in all places, for the culture and edification of the whole people, he is not—he cannot be, an American statesman.”

PAPERS ON SPECIAL
SUBJECTS.

Deformities of the Neck.

ERNST H. ARNOLD, M.D., NEW HAVEN.

Like the author of many better papers, I find myself confronted by the difficulty to give to the paper I am about to present to you a suitable title. It can manifestly not be my purpose to treat all deformities of the neck in a short paper. Indeed, I am going to devote the main part of the paper to just one etiological factor of neck deformity. Since the deformities produced by this factor are not uniform, the title nevertheless is in a measure appropriate. In order to assign these deformities as well as the etiological factor their proper place, I shall have to precede the subject *per se* by a short review of the etiology of deformities of the neck in general. In this I shall follow Hoffa somewhat closely. Deformities of the neck, like all other deformities, may be,

- (a) congenital,
- (b) acquired.

The congenital ones may in turn be,

- (a) primary,
- (b) secondary congenital deformities.

Primary congenital deformities are such abnormalities of development, the cause of which is inherent in the germ cell, and not to be sought in external influences. To this class the deformities of which I am to treat belong.

Secondary congenital deformities are caused by extra embryonic forces influencing a foetus, which may be normal or diseased. Examples of such causes are adhesion of the amnion to the foetus, scant amniotic fluid, multiple pregnancy, neoplasms of the uterus.

Congenital deformities of the neck have heretofore usually been classed in this category, especially the form known as torticollis. From the account of the cases hereafter to be

mentioned, it may safely be assumed that such classification has in most cases been erroneous.

The acquired deformities may be arranged analogously to the congenital ones as being,

- (a) primary,
- (b) secondary.

Primary acquired deformities must be rare, for in them cause of deformity, and the effected deformity, must be directly and practically simultaneously connected. They follow injuries, such as fractures and dislocations.

Deformities of the neck of this type must necessarily be very rare, for dislocation or fracture of the neck usually is fatal. Yet I saw last winter at the orthopedic section of the New York Academy of Medicine, a case where a misstep from the sidewalk brought about a dislocation of a cervical vertebra, in all probability previously diseased, in a posterior direction, causing thereby what I would style a *caput obstipum anteriore*.

The secondary acquired deformities are in contradistinction to the above such, where cause and effect are only indirectly connected, and remote as to the time intervening between the two.

They are subdivided in weight deformities and contractures. In the first of these categories we distinguish,

- (a) Weight deformities that come to exist with sound bone tissue,
- (b) such as will be accompanied by disease of bone tissue.

Weight deformities with sound tissues occur as,

- (1) habitual,
- (2) vestimentary,
- (3) static weight deformities.

Weight deformities of the neck of this type belong nearly exclusively to the first class. It is easily seen that different power of vision or hearing, on one or the other side, will bring about in course of time a habitual malposition of the head, resulting in either left or right torticollis, left or right caput obstipum, or caput obstipum anteriore.

Tubercular spondylitis contributes most cases of weight deformities of the neck with diseased bone tissues. The well-known angular deformity, or gibbus, produces a *caput obstipum anteriore*. Rickets are not frequently responsible for neck deformity of this kind.

Turning our attention to contractures as a cause of neck deformity, we have in the first place contractures of the skin, bringing about, as in the case of extensive burns on the side of the neck, *torticollis* or *caput obstipum* to either side.

Connective tissue contractures we find in this region very commonly resulting from tubercular cervical glands that have broken down, thereby causing extensive connective tissue scars, which pull the neck over to one or the other side, giving rise to *caput obstipum*.

Muscular contractures were formerly held to be responsible for the majority of cases of *torticollis*. Hæmatom and myositis, following tearing of the sterno-cleido muscle, were thought to sufficiently explain the contracture found in these cases. While there can be no doubt that a great many cases of *torticollis*, arising soon after birth, must be due to this cause, a considerable number of cases heretofore classified under this heading will nowadays, with better facilities for examination, be found to belong either under the category of true congenital deformity, or then in the class of neurogen contractures.

The division of neurogen contractures presents,

- (a) reflex,
- (b) spastic,
- (c) paralytic contractures.

All three classes contribute their quota of cases to neck deformities.

The aforementioned tubercular cervical glands, before breaking down and giving rise to contracture, will cause sufficient pain to make contracture, in a manner so as to relieve the pain, very likely.

Spastic neck deformities, usually in the form of *torticollis*, are not infrequently found following meningitis, more rarely

myelitis, and are quite frequently associated with disturbances of the brain.

Paralytic neck deformities, usually in the form of torticollis, are the sequence of peripheral or central nervous disease, especially the latter, poliomyelitis claiming a small number of the cases.

In the foregoing tabulations I have made use of the terms *caput obstipum* and *torticollis* in seeming contradistinction. This I have done advisedly, for I hold the promiscuous and indiscriminating use of these terms to be misleading. A *caput obstipum* is a deformity of the neck which inclines the head in either direction of a lateral or anterior posterior plane without rotation. *Torticollis*, better called *collum tortum*, or perhaps *collum distortum*, on the other hand, is a deformity of the neck which inclines the head in one direction of a lateral as well as posterior plane, but to which inclination is added a rotation in either direction around its long axis.

According to the direction in which the head inclines in the former deformity, we should speak of *caput obstipum anteriore*, *posterio*, *dextrum* and *sinistrum*. The *torticollis* should be designated as a *collum dextre* or *sinistre distortum*.

Defining deformity as a change from normal form or direction of one or more bones, we may come across deformities consisting in change of form of bone as yet without change of direction, and which, therefore, are very difficult of recognition, should the deformed bone lie deeply imbedded in the soft tissue.

This kind of deformity exists quite frequently in the neck, and as it offers unusual obstacles to recognition by common means of investigation, it is often overlooked altogether; certainly as long as it has not brought about change of direction of the bones of the neck, or when it has done this, the causative factor is not recognized, a false etiological diagnosis made and relief vainly sought. The etiological factor that has come into prominence of late, productive of cases of this type, is the so-called cervical rib. Cases of cervical rib are being reported with increasing frequency every day, and as I have had the

good fortune to come across a number of them, I shall briefly relate them here, and make such deductions with regard to the above table of the etiology of neck deformities, and the opinions as expressed by various authors on this subject, as they may warrant.

CASE 1.—Girl, 2 years; family history negative. First child, normal delivery; general health good, deformity not noticed until child was 2 years. Neck seemed short, trapezius hard in cervical portion, head drawn well forward.

Examination.—Confirms in general the facts above related. The hardening of the trapezius proves on either side to be an easily palpable, fairly well-developed cervical rib. This accounts for the pushing forward of the head, and for the seeming shortness of the neck.

Diagnosis.—Caput obstipum anteriore, due to cervical ribs. (No X-ray examination.)

CASE 2.—Girl, 17 years; family history not obtainable—adopted child. No deformity noted at adoption; developed torticollis, which progressed as years went on.

Examination.—Well marked torticollis, with very distinct asymmetry of face. Under trapezius of left side a bony mass of shape and direction of a rib is easily palpated.

Diagnosis.—Torticollis, due to cervical rib. (No X-ray examination.)

CASE 3.—Man, 48 years; family history negative. Ten years ago first noticed pain shooting in character running from shoulder down right arm. Subsided never altogether, but for one year past has become so aggravated that work had to be given up, and medical advice sought. Various diagnosed as rheumatism, later as occupation neurosis.

Examination.—Muscles of right arm small and soft, but not markedly atrophic; regions of hyperæsthesia change from one examination to another. Power diminished, differing greatly at different times. On right side of neck bony mass of general configuration of a rib is plainly made out above the first rib.

Diagnosis.—Cervical rib producing pressure neuritis. (No X-ray examination.)

CASE 4.—Girl, 2 years, first child, difficult delivery; deformity noticed plainly since child began to walk, suspected earlier by mother.

Examination.—Head inclined to left, but not turned, as yet passively freely movable in all directions. No contracted muscles or soft parts palpable. A bony body on left side of neck above the first rib easily made out.

Diagnosis.—Caput obstipum sinistrum, due to cervical rib. (X-ray confirms diagnosis, showing a well-developed cervical rib reaching all the way around to the sternum.)

CASE 5.—Girl, 10 years; history unavailable, except that deformity noticed from birth, and since then progressing.

Examination.—Well-marked torticollis.

Diagnosis.—Torticollis. (X-ray shows two well-marked symmetrically disposed, still short, cervical ribs.)

CASE 6.—Man, 33 years; four years ago noticed neck gradually becoming stiff, stiffness progressing with but little pain up to present time. Various diagnosed as rheumatism, and treated without results.

Examination.—Head inclined forward somewhat, all movements limited, no contracture of soft parts. On sides of neck above first rib two bony bodies are made out.

Diagnosis.—Caput obstipum anteriore, due to cervical ribs. (X-ray examination confirms the diagnosis, showing two short but very broad cervical ribs.)

Looking over these cases, I find that they have occurred all within five years in private practice. While I have not had time to count up my cases of neck deformity, in this period, I have no doubt that these cases constitute a considerable percentage of the sum total. Offhand I might say that they would be certainly as much as 10 per cent. of such cases. All these cases being congenital, and what is more, primary congenital, the conclusion seems warranted that congenital deformity of the neck is much more frequent than had been supposed. Hoffa, Bradford and Lovett, Young, Whitman, all declare congenital deformity of the neck to be rare. While it must be admitted that neck deformity in general is comparatively rare, con-

genital deformity is certainly not rare in the number of neck deformities. Neck deformity due to cervical rib may produce torticollis to either side, or caput obstipum anteriore, irrespective of the number of cervical ribs or the side on which they are situated, or it may produce no outwardly visible deformity at all. The deformity as well as any subjective symptoms may be absent at first, and, with the progressive development of the cervical ribs, become established and progressive.

The two cases of cervical ribs producing symptoms and deformity in adult life suggest that these atavistic tissues may take on accelerated development after the normal skeletal bones have reached the end of development.

The case of seeming neuritis here reported, as well as the similar case reported by Dr. Hartshorn some time ago in the *Yale Medical Journal*, should make one think of cervical rib as a cause of such cases of neuritis of the arm where an etiological factor can otherwise not be found.

The X-ray is a very great and nearly indispensable guide in confirming the diagnosis of these cases.

The treatment indicated in all these cases is, of course, excision. The prognosis, with improved technique for these operations, should be good.

DISCUSSION.

DR. HENRY L. SWAIN (New Haven): As Dr. Cook has just said, something has been sprung upon me within the last five minutes that has very much impressed me, and I must say that I have been extremely interested in the remarks of those who have spoken in discussion, as well as in the original paper.

We have all been familiar, perhaps, with the assertions of those who believe that oblique astigmatism sometimes is the cause of crooked neck, and that the constant attempt, by placing the head at an angle, to thus right the astigmatism, is the potential factor.

After years of thought and study on the subject of the causes which produce bends in the nasal septum, it finally appeared that one of the most potent causes is facial asymmetry. Now we have plainly a little circle, made by the remarks of the first speaker, whereas the crooked neck has made the facial asymmetry, facial asymmetry has made the

crooked septum. It is a cycle of change. I think it is very interesting, if it is all true, for now oblique astigmatism must be reckoned with if we would include all the factors which work to produce pathological conditions within the nasal cavity.

DR. E. H. ARNOLD (New Haven): It was not my intention in bringing this matter before you to outline the treatment of torticollis, because this has by this time been thoroughly thrashed out. I wanted, in the first place, to call your attention to the fact that there are other neck deformities than torticollis, and that we must look for a variety of etiological factors. We must find out if the congenital deformity is caused by irregularity in the development of the vertebræ.

I have looked at quite a number of X-rays of fœtus; a series of them at random, but I have never come across a different development in the two sides of vertebræ showing at any period of fœtal development.

I have seen one case in an adult of one vertebræ being developed on one side only, but whether this was due to causes operating before birth or after, it was too late to tell. There is no doubt, however, as to cervical rib existing in children, that the children are born with it, that the ribs are usually poorly developed at birth.

However, the one I saw was perfect, and showed in the X-ray so plainly that there could be no doubt about its being a cervical rib reaching all the way around to the sternum. This cervical rib produced torticollis. The malposition and the contracture of the soft tissue will follow as a consequence and with these they have the symptoms of torticollis. It is quite frequent (two of my cases show this) that these ribs develop more after the normal skeleton has stopped developing. In the second adult, the one that shows a very broad cervical rib which impinged upon the transverse processes above and below it, it broadened if it did not lengthen later in life.

The matter of traveling of the organs of special senses in the head, in cases of torticollis, in consequence of loss of balance, is firmly established, and also that it is a vicious circle in which the patient moves.

One case came to me with a well-marked torticollis with the typical distortion of the cranium. The child, which had adjusted the eyes perfectly to the new position, its eyes standing in a horizontal plane in the distorted face, had no trouble with vision. Just as soon as I straightened the neck the child had eye trouble, and had to be referred to the oculist. The child had to wear glasses, because the eyes were in the corrected position of the distorted cranium, not in a horizontal line, so their previous adjustment to the oblique position now was a faulty one in the straight position. This child also showed the teeth changing their position in the jaws, so as to approximate the

vertical position, the only position in which you can masticate. And so on straightening up the head, the child's teeth once more stood obliquely, and a great deal of trouble in masticating followed. A dentist putting on an anchor and trying to pull them just the wrong way from which my straightening of the head would have put them, increased this trouble. I had to interfere with the dentist and tell him to let the teeth alone, as they were coming up to proper position all right if he gave them time.

This traveling into the proper position for function of the organs of the cranium, in order to adjust themselves to the changed circumstances brought about by the inclination of the head, can be observed in all cases of torticollis of long standing and their rechange as well when treatment is instituted.

Hypertrophic Pyloric Stenosis in the Infant : Report of a Case, with Recovery after Operation.

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It is peculiarly fitting that our Society should discuss infant pyloric stenosis, for the reason that just a century before Hirschsprung (1) of Copenhagen established the disease before the profession in 1888, a member of the New Haven County Medical Society, Hezekiah Beardsley (2), put on record in the "Transactions" of that Society the first known. "Case of Scirrhus of the Pylorus of an Infant."

The essential pathological condition is a hyperplasia of the circular muscle fibers at the pylorus, forming a tumor mass of gristly hardness about the size of a hickory nut. The mucosa of the constricted outlet of the stomach lies in longitudinal folds. The lumen may be partially or completely closed. The stomach undergoes a compensatory hypertrophy and later a dilatation and thinning of its walls. A catarrhal condition of the mucosa may eventually occur. The gut is collapsed. General emaciation and a secondary anæmia follow as logical sequences.

As a rule the symptoms are rational. An apparently perfectly healthy breast-fed baby suddenly, without discoverable cause, vomits a but slightly changed stomach content. This is repeated at variable intervals. The bowels become constipated, but otherwise the stool is satisfactory. Baby is hungry. His fretting and crying cease immediately that he is put to the breast. He loses weight. At this time physical examination may be entirely without positive findings. However, the negative findings—the clean mouth, the sweet breath, the costive but otherwise normal stool, and the physical contentment when, after vomiting, baby is put to the breast—are of the utmost importance. As days elapse, in perhaps one-

third of the cases, a tumor may be felt deep to the liver in the right hypochondrium. If felt, it is hard, oval, freely movable, and not tender. A peristaltic wave running from left to right in the left hypochondrium and epigastrium is probably present at some time in almost all cases. However, it often is not demonstrable at the time of examination. For this reason, examination of a suspected case should be made frequently, at times after nursing, at times after vomiting, always with the child upon its back, in a warm quiet room, completely undressed. Occasionally, by following the peristaltic wave, the finger may be led to the pyloric tumor which previously had escaped palpation. With a considerable degree of dilatation of the stomach, the visible peristaltic wave may be entirely absent. The abdomen is disproportionately full in the upper part. In late cases the stomach may be fairly seen. Rigidity and tenderness are lacking.

The act of nursing is characteristic. The infant takes the breast eagerly, but, unless the stomach has been recently emptied, he is shortly satisfied. He soon shows signs of distress. Should vomiting occur, the distress is promptly relieved. Without vomiting, fretting may persist almost continuously.

Vomiting at first bears no relation to nursing. Later, each feeding may be thrown up directly after nursing; or, after two or three feedings, a larger amount than any one feeding may be vomited. Vomiting varies with the degree of patency of the pylorus and the condition of hypertrophy or dilatation of the stomach. Typically the act is almost projectile. It is almost never the frequently seen early regurgitation, nor does it resemble the spitting up of the "sour baby."

Analysis of the stomach content aids but little in making a diagnosis. Hyperacidity is rarely present. Bile has been observed more than once. Blood is only very exceptionally present.

The characteristic stool is that of simple constipation. Cases have been reported fairly frequently, however, where

diarrhœa has been very persistent. In the unusual cases of complete occlusion at birth, nothing passes the rectum but meconium, and feedings are vomited entire.

The onset of symptoms, in the majority of cases, is some time during the third week. However, it may be delayed to the third month, or vomiting may occur the first time the babe is put to the breast.

All authorities agree that the condition probably occurs much more frequently than was formerly believed. Probably death certificates of marasmus, chronic gastritis, inanition, infantile atrophy and congenital debility have often done duty for hypertrophic stenosis. The condition obtains most frequently in males. It is rare in the Latin and Slavonic races. The majority of cases occur in breast-fed infants. But these points do not seem to be significant, as the essential cause of the condition remains unknown. It may be due to a developmental congenital hypertrophy of the pylorus, and this theory is the one most commonly held. By some, the tumor is held to be a later development, dependent upon incoördination of the nervous system of the stomach. A third theory explains the muscular hypertrophy as due to continuous spasm, reflex from gastric irritation.

In the case to be reported, the points possibly bearing upon the etiology are the gastric neoplasm of a grandparent, and the possible irritation caused by some alteration in the mother's milk due to her febrile polyarthritis.

If, in all cases of vomiting with loss of weight, the pathology of pyloric stenosis be kept well in mind, diagnosis will usually not be difficult, since the larger number of cases are quite typical. Diagnosis is not to be made from any one sign or symptom, for none is pathognomonic. Nor is it necessary to have all symptoms present. It is from a grouping of the noted symptoms, which fail of alleviation under the most careful infant feeding, that a final conclusion is to be reached.

A breast-fed vomiting infant should bring this condition to mind. If analysis of the mother's milk sheds no light, if wet

nursing or careful modifications of clean cow's milk fail to control the symptoms, and loss of weight is progressive, the case is suspicious. If constipation is obstinate, the diagnosis is probable. With the presence of a palpable tumor, or visible left to right peristalsis, the diagnosis is practically certain. However, certain cases have been reported by reliable observers which fulfill the conditions of diagnosis of hypertrophic stenosis, which have recovered under palliative treatment. Such cases are to be looked upon as a relative stenosis, due to hypertrophy of the muscle tissue plus a more complete stenosis dependent upon a congestion of the pyloric mucosa; or they may be regarded as simple pyloric spasm. If the former, palliative treatment may give relief, but gain will be slow and the ultimate prognosis bad. If the latter, palliative measures should give fairly prompt relief. Simple pyloric spasm is probably extremely rare in the infant. Diagnostic points favoring the spastic type of stenosis are temporary subsidence of symptoms with a non-progressive disturbance of nutrition, alternation of diarrhoea with constipation, and marked changes in stomach content. In probable cases, where palliative measures fail to prevent loss of weight, diagnosis by exploration is indicated, before the condition of the child reaches the point where such interference and the probable operation for relief would be unduly hazardous. In severe and neglected cases the diagnosis may have to be made from one of the forms of meningitis. Here, if the positive data for meningitis are lacking, the abdominal signs must decide. Without the presence of a tumor, differentiation from simple atresia is impossible.

Treatment of those cases where onset is early and obstruction complete, or nearly so, should be operation immediate upon diagnosis. Scudder (3) has done a posterior gastro-enterostomy on the fourteenth day, the patient being perfectly well at two years.

Cases of later and more gradual onset may be treated for a time with the medical measures to be outlined later. Such treatment should last long enough to exclude simple pyloric

spasm, but under no circumstances should it be persisted in until the child's condition would not warrant operation. Undue delay is fair neither to patient nor to surgeon. With diagnosis established, operation by a surgeon of large gastric experience should be urged. He should be one properly equipped to carry out with speed and precision his extremely delicate task. The operation of choice in the United States is conceded to be a posterior gastro-enterostomy with a short loop. Abroad the Loreta operation has first place.

Should operation be refused or should proper surgical aid be not available, resort must be had to medical treatment. But the chances of recovery are far less, and the ultimate results are far from as satisfactory as under surgery. Thus, recorded cases show over fifty per cent. of recoveries following operation (4). At the present state of stomach surgery, with early diagnosis and little delay in operating, we should expect recovery in three-quarters of all cases. In selected cases in the best of hands even better results are to be anticipated.

I do not know of extensive collected statistics for non-operated cases, but probably ten per cent. would cover all satisfactory recoveries of diagnosed hypertrophic stenosis—and such diagnosis, without operation or autopsy, is open to some doubt. Bloch (5) of Copenhagen, an ardent advocate of medical treatment, reports ten cases treated non-surgically with but three deaths. However, by recovery he seems to mean merely that his cases were alive on discharge from the hospital. For, with but one exception, though the infants had gained flesh, they were rickety, underweight and anæmic. Some were still vomiting or had gastric retention after two and three-quarter hours. Such results compare not at all with the brilliant after-histories of Scudder (3), (4), Nicoll (34), (6), Hartley (7), Munro (24), Elting (9), Murphy (10), Torian (11), and others.

Palliative treatment consists, first, of finding the best tolerated food. The child should be put to breast two or three minutes every hour, perhaps preceding nursing by some alkali. If no gain is made, a wet nurse, if available, should be obtained.

Or a dilute modification of cow's milk with whey may be employed. The mother's breasts must not be dried up, as her milk will be of the greatest importance if operation be finally accepted. Eventually resort may have to be made to some of the infant foods or to dilute condensed milk. Rectal injections of saline or nutritive enemata are to be administered in inverse ratio to the amount of fluid passed by the pylorus. The body may be rubbed with cod-liver oil. Gastric lavage with a dilute alkali, twice daily, is probably of greater benefit than any one other palliative measure. Warm fomentations covering the whole abdomen are also of value. They should be changed every two or three hours. As regards drugs, the antacids and small doses of opium or codeine by mouth are warmly recommended. Sodium citrate, theoretically at least, should be of value when cow's milk is given. Bromides or chloral hydrate, by rectum, are directed against the spasmodic element. Stimulants are also best given by rectum in the form of dilute alcohol. For a laxative, milk of magnesia, in small amounts frequently, is probably the best. In extremely emaciated subjects an attempt may be made to guide the stomach tube to the pylorus in the hope of entering and dilating it.

In brief, then, treatment is by choice surgical. If seen in excellent condition, a few days of medical treatment is justifiable. If in fair condition, operation should be immediate. If in bad condition, palliative methods offer a hope of recovery and some chance of bettering the infant's condition so that an operation can be undertaken later with less risk. Before urging operation the skill, experience and equipment of the available surgeon must be carefully considered.

Immediate prognosis has been considered in the discussion of treatment. In a word, without operation it is extremely bad. With operation it varies, with the condition of the child and the skill of the operator, from good to fair.

As regards late results, the eventual outcome of medically treated cases must always be dubious. A number of cases,

among them Beardsley's, have been observed dying or requiring operation in early childhood. After operation the late results are brilliant. Except very occasionally, the infants progress perfectly normally in every way. I think it may be safely said that gastro-enterostomy does not interfere with alimentary functions to the detriment of general development. Paterson (12) of England reviewed this subject carefully before the American Medical Association last year. As regards the possibility of restoration of the lumen of the pylorus and the closure of the artificial opening, it may be said that such will probably not be the case. Murphy (10) reports a post mortem six months after operation, at which it was shown that the pyloric tumor persisted and the artificial opening alone was functioning. Death was from a cause in no way connected with the gastric lesion.

CASE REPORT.

Baby X, born June 17, 1907, was a boy, the first child of unusually healthy young American parents. One grandparent probably had a malignant growth of the cardiac end of the stomach. Pregnancy was normal. Delivery was at term and by low forceps. Except for faint nævi of forehead and occiput, physical examination at birth was normal. His weight was eight pounds. Both mother and child progressed perfectly. Milk was abundant and birth weight was regained at the end of one week. July 22, a week after reaching a Maine coast resort, the mother developed the first symptoms of a febrile polyarthrititis which has shown itself to be the hypertrophic type of infectious arthritis. Four days later the boy, at the age of five weeks and four days, had his first ill moment, an acute attack of vomiting and diarrhœa. He continued to vomit once or twice daily, became constipated and steadily lost weight. As the vomitus contained some brownish mucus the local physician gave the infant medicine for gastritis. After a week, upon the advice of a second physician, baby was put upon diluted cow's milk, and later a prepared

infants' food was given without change in symptoms. On August 11, sixteen days after onset, baby's weight had dropped one-quarter of a pound, to eleven pounds four ounces. During the next two weeks there was a loss of twenty-six ounces more. Vomiting would be absent one day only to recur two or three times the day following. Constipation persisted, but was not obstinate. I saw him on August 24, thirty-one days after onset. Physical examination showed a very evident loss of weight, but no extreme emaciation. The general condition was good. There was a moderate general papillary erythematous rash. The head was retracted to the right. The right eye was the site of a slight conjunctivitis. His appearance suggested meningitis. However, the ability slowly to flex the head without distress, the absence of disturbance of the temperature, pulse and respiration, the absence of Kernig's sign and the normal fontanelle were sufficient to exclude it. The tongue was clean and the breath sweet; the stool small, hard, smooth and brown. The upper abdomen was tympanitic, and, in contrast to the lower part, distended. He fed eagerly, but was satisfied shortly. Further examination seemed normal. A probable diagnosis was made, and one ounce of a 2.-6.-66 certified milk containing five per cent. of lime water was given every two hours. Ten minims of milk of magnesia was added to each feeding until bowels moved. On the following day the bowels had moved well, baby had vomited once, about two ounces with force. At this examination, though no peristaltic wave was to be seen, it was believed that the typical pyloric tumor could be felt. This observation, however, was probably incorrect, as no tumor could be palpated when the infant was under ether, previous to operation. The next day Dr. Steiner kindly saw the case with me. Left to right peristalsis was seen for the first time, leaving no room for doubt as to the diagnosis. The weight remained constant. Vomiting had not occurred for twenty-four hours. One ounce of whey was ordered between the milk feedings. On the day following, since there was no gain in weight, in spite of better gastric retention and partial relief of constipation, operation was urged and

accepted. The next afternoon Dr. J. C. Munro of Boston, who kindly permits me to describe the operation, did a gastro-enterostomy at the Carney Hospital. Just previous to operation, even under ether, except for upper abdominal distention, examination was negative.

Baby's extremities and chest were wrapped in cotton-batting and he was placed upon an electrically warmed operating table. Ether was given lightly by the drop method. On opening the abdomen a greatly dilated and thinned stomach was exposed, terminating in the typically gristly pyloric tumor, the size of a small English walnut. The distal gut was extremely contracted. The nodes in the mesentery were enlarged to the size of small peas. The omentum was a mere lacy film. The stomach was opened by a small puncture on its anterior wall, its contents expressed on pads and the opening closed. A short-loop posterior gastro-enterostomy was done with clamps; the opening in the transverse mesocolon sutured, and the parts replaced in normal position. The abdominal wall was closed in layers. The duration of the operation was twenty-three minutes. The child's condition was good throughout. Too great credit cannot be given Dr. Munro for his carefully thought out and faultlessly executed technique.

On return to bed baby was put in a semi-upright posture. Water was given by mouth by drops every five minutes. Vomiting of a small amount of mucus of fecal odor occurred once. On the following day the temperature rose to 102° , where it remained for forty-eight hours. Feedings were given frequently in small amounts, consisting of dilute modifications of cow's milk with whey proteid. On the third day his condition was critical. From then on recovery was rapid. On the fifth day the baby was brought to Hartford, suffering nothing from its journey. Healing was by first intention. The strength of the milk mixture was rapidly increased.

Except for a two days' attack of bronchitis during the grip epidemic last winter, progress has been perfectly normal. The teeth came without delay. There has not been any disturbance of the alimentary tract. At present, nine months after oper-

ation, at the age of eleven months, he is perfectly vigorous and happy. His weight is twenty-one pounds.

REFERENCES.

The most valuable articles are (4) and (28), being written by adherents to the surgical and medical viewpoints respectively. The remaining references are of interest historically, or are more recent than the bibliographies of (4) and (9).

- (1) Hirschsprung. *Jahrb. f. Kinderh.* 1888, Vol. xxviii, p. 61. Two cases. Vol. lv, p. 596 (not important).
- (2) Beardsley. *Trans. New Haven County Med. Soc.*, 1788, cit. Osler, *Bost. Med. and Surg. Jour.* March 12, 1903.
- (3) Scudder. *Bost. Med. and Surg. Jour.* September 5, 1907. (Three operative cases with recoveries.)
- (4) Scudder and Quinby. *Jour. A. M. A.* May 27 and June 3, 1905. (Cases collected to date—extensive bibliography.)
- (5) Bloch. *Jahrb. f. Kinderh.*, Berlin, 1907 S. 337 u. 477. Die Angeborene Pylorus Stenose u. ih. Behandlung. Twelve cases. (1) Palliative treat. Discharged undersized and with marked rickets. (2) Palliative treat. Discharged weak, anæmic and underweight. Passage of tube showed retention of stomach content two and three-quarter hours after feeding. (3) Palliative treat. Death—autopsy. (4) Operative (Loreta). Death due to peritonitis following perforation of duodenum at operation. (Bad technique.) (5) Operation. Hemetemesis—death, due to tearing of stomach wall during Loreta operation. (Bad technique.) (6) Palliative. Death—autopsy. (7) Palliative. Gained two pounds in three months. (Condition on discharge not stated.) (8) Palliative. Death. (This infant doubled its weight while in hospital, only to have a return of symptoms terminating fatally.) (9) Palliative. Recovery—rickets. (10) Palliative. Recovery—late report states condition good, but child small. (11) Palliative. Recovery—in three months gained over three pounds—vomited occasionally on discharge. (12) Palliative. Recovery—no rickets.
- (6) Nicoll. *Brit. Med. Jour.* September 1, 1900, p. 571. One case. Loreta operation. Recovery.
- (7) Kimball and Hartley. *Archiv. of Ped.* 1907, Vol. xxiv, p. 207. One case. Operation (Post. gast.-ent.)—recovery—after history.
- (8) Munro. *Bost. Med. & Surg. Jour.* August 18, 1904, p. 189. One case. Operation (Post. gast.-ent.)—death.

- (9) Shaw and Elting. *Albany Med. Ann.* January, 1905. One case. Ant. gast.-ent. Recovery. At eleven months—weighs twenty-two and one-half pounds.
- (10) Morse, Murphy and Wolbach. *Bost. Med. & Surg. Jour.* April 9, 1908. Post mortem exam. of infant (death from peritonitis following circumcision) six and one-half months after successful short-loop post. gast.-enterostomy. Persistent pyloric tumor with closure of the pylorus discovered.
- (11) Torian. *Ind. Med. Jour.* Vol. xxvi, No. 2. One case. Heinecke-Mikulicz pyloroplasty. Well at ten months, weight eighteen pounds.
- (12) Paterson. *Jour. Am. Med. Assoc.* August 24, 1907, p. 657. The Operation of Gastro-jejunostomy and its Physiological Effects.
- (13) Gilbride. *N. Y. Med. Jour.* May 25, 1907. One case. Medical treatment. Death. No autopsy.
- (14) Carpenter. *Lancet.* February 15, 1908. One case. Recovery under palliative measures. Advocates delay of operation as long as possible. (Short abstract of paper.) See also *Lancet*, March 14, 1908, same case.
- (15) Sheffield. *Post Grad.* 1907, xxii, p. 810. One case (not in full). Palliative treatment. Recovery.
- (16) Herman. *Pediatrics.* 1907, p. 660. One case. Palliative treatment—at nine months feeble and pale.
- (17) Guillemot. *Bull. Soc. de Pédiat. de Paris.* 1907, ix, p. 267. One case. Symptoms from birth—death at seven weeks. Autopsy. Medical treatment.
- (18) Townsend. *Bost. Med. & Surg. Jour.* April 9, 1908. One case. Operation after four days' delay. Hurried anterior gastro-enterostomy because of feeble condition of patient. Death after three days.
- (19) Sutherland. *Lancet.* March 16, 1907. Advocates palliative treatment. Case reports.
- (20) Meyer, L. F. *Monatsch. f. Kinderh.* Bd. vi, No. 2, May, 1907, cit. *Munch. Med. Woch.* July 16, 1907. Three fatal cases. Concluded death was probably not so much from inanition as from alimentary intoxication.
- (21) Schitomirsky. *Dissertation*, Berlin, 1906, cit. *Munch. Med. Woch.* January 29, 1907. Two cases of successful palliative treatment. Would limit operation to undoubted congenital organic or to complete stenosis.
- (22) Ramsey. *Jour. of Minnesota Med. Assoc. and N. W. L.* January 15, 1907. Two cases. (1) Operation six weeks after diagnosis. Death—autopsy. (2) Medical treatment. Death—partial autopsy.

- (23) Fuhrman. *Jahrb. der Kinderh.* 1907, iii, p. 329. One case. Medical treatment. Recovery.
- (24) Rotch and Ladd. *Archiv. of Ped.* 1905. Two cases. (1) Operative (by Munro)—recovery. (Post. gast.-ent.) (2) Operative (by Stone)—death. (Ant. gast.-ent.)
- (25) Lyman, C. B. *Trans. Colorado Med. Soc.* 1907, Vol. vi, 175. (Reference not available.)
- (26) Pool, B. G. *Washington Med. Ann.* 1907-8. Autopsy at age of 17. (Doubtful case.)
- (27) Griffith. *Archiv. of Ped.* October, 1905. One case. Medical treatment. Recovery.
- (28) Pfaundler. (Translat. by Wynkoop, in English edition of *Pfaundler and Schlossmann's Handbook.*) 1906, Vol. iii, p. 199. Recognizes two types—organic congenital, and spastic. Accentuates the importance of the latter. Believes surgical mortality sixty-five per cent.
- (29) Wernstedt. *Nordiskt Mediciniskt Arkiv.*, 1906, Afd., cit. *Jahrb. f. Kinderh.* Bd. 64, p. 393. From extensive postmortem material recognizes two types. (1) Landerer-Mayer type (congenital hypertrophic). (2) Hirschsprung type (pylorospastic, with the longitudinal folds in mucosa).
- (30) Heubner. *Therap. der Gegen.* October, 1906, Heft. 10. Forty-nine cases. After-histories in twenty-one. Two only died. Holds condition due to congenital neurosis of stomach. Can not convince himself that there is a true hyperplasia. Advises operation as a last refuge if recovery has not occurred at end of third month of life.
- (31) Sutherland, G. A. *Trans. Clin. Soc.* London, 1907, xl, p. 98. Three cases. Two medical, with recoveries. One surgical, with death. Cause for death at autopsy not made out. Believes antispasmodics of no value.
- (32) Voelcker, A. *Trans. Clin. Soc.* London, 1907, xl, p. 108. Seven cases, all treated medically. Two recoveries, one not satisfactory. Five deaths, four autopsies. Of thirty-nine cases at Great Ormond Street eighty-seven per cent. deaths.
- (33) Burghard. *Trans. Clin. Soc.* London, 1907, xl, p. 122. Sixteen operative cases (Loreta), with ten recoveries. Two of the fatal cases were extremely feeble and emaciated. One fatal case died three months post-operative in convulsions. Two fatal cases had their duodenum lacerated at operation.
- (34) Nicoll. *Brit. Med. Jour.* October 29, 1904, p. 1148. Nine operative cases—six recoveries. Five non-operative cases—3 recoveries. Advocate of Loreta operation.
- (35) Koplik. (Published since the reading of this article.) *Am. Jour. Med. Sciences.* July, 1908. Fifteen cases. Excellent discussion of the spastic and hypertrophic types.

DISCUSSION.

DR. WALTER R. STEINER (Hartford): As Dr. Kingsbury has well said, we should indeed felicitate ourselves upon the fact that the first observation of a case of congenital hypertrophic stenosis of the pylorus in infants was made by a Connecticut man, Dr. Hezekiah Beardsley, who gave an account of his case in a volume entitled "Cases and Observations," which was published as the Transactions of the New Haven County Medical Society, in 1788. We in Hartford County are also proud, because Dr. Beardsley, although a member of the New Haven Society, was a resident of our county, living first at Southington, where he appears to have practised medicine as far as his health would permit. He also kept a drug store, and continued there in this business until his removal to Hartford in 1780. In Hartford he had his drug store in a location, at one time, "a few rods east of the Court House," but we have no information as to whether he acted here as a practicing physician. His poor health gravely interfered with his business and caused him to go to Savannah in 1789. He died of consumption on May 10, 1790, in his forty-second year. From an obituary in the *Connecticut Journal*, we read: "He sustained an irreproachable character through life, and died universally lamented by his acquaintances. Reading and reflection had furnished him with an unusual portion of useful knowledge, and those who knew him best always admired that firmness, accuracy and strength of mind, which rendered him one of the most independent of men."

Beardsley entitled his article "A Case of Scirrhus of the Pylorus in an Infant" and noted practically every feature of this disease we now know. He had attended the patient for three years at Southington, and, when her death at the age of five years "closed this painful and melancholy scene," he performed the autopsy. He speaks of the "constant puking," which was first noted during the first week of life. Everything in the shape of food the child took was almost instantaneously ejected, and very little changed. The fæces were small in quantity. He comments upon the leanness and wizened old look of the child, and states he had "pronounced a scirrhusity in the pylorus months before the child's death," although he first attributed the condition to a deficiency of the bile and gastric juices, joined with a morbid relaxation of the stomach. Unfortunately, Beardsley did not know of the child's death "until the second day after it took place. This late period, the almost intolerable stench, and the impatience of the people who had collected for the funeral, prevented so thorough an examination of the body as might otherwise have been made." At the autopsy Beardsley noted that the stomach was unusually large and distended. "The pylorus was invested with a hard compact substance or scirrhusity, which so completely obstructed the

passage into the duodenum as to admit with the greatest difficulty the finest fluid." He concludes, "The necessity of interring the body that evening put a stop to any further examination," and so forbade a more particular and accurate description of this very "singular case."

After Beardsley, nothing was heard of this "singular" condition until 1841, when Williamson of England reported an instance which Cautley took to be the first recorded. This was followed by another example of the affection in France. Since then no reference to it is to be found in medical literature until 1888, when Hirschsprung aroused an interest in this subject, which has since continued. The cases have rapidly multiplied since then, and if we pay more attention to the symptoms, largely as outlined by Beardsley, I am sure the condition will be still more commonly met with.

The characteristic vomiting, the history of a gradual and progressive loss in weight, notwithstanding careful feeding, the visible gastric peristalsis and the presence of a palpable pyloric tumor are factors capable, if grasped, of making a ready diagnosis. It is the cases of a partial and not a complete obstruction which require somewhat more skill in diagnosis, but even these, if carefully studied, may be precisely differentiated from other conditions. I regret that my time does not suffice to speak more at length upon this subject. I had the pleasure of seeing, in consultation with Dr. Kingsbury, the case he has so carefully reported. It is indeed a pleasure, also, to note that this second case in Connecticut, reported after a lapse of one hundred and twenty years, has had so accurate an observer as Dr. Kingsbury, who was able, at the proper time, to turn over his patient to a surgeon for surgical treatment—a method which, unfortunately, Dr. Beardsley did not have at his command, as it was not introduced until one hundred years later.

DR. HAROLD S. ARNOLD (New Haven): It seems as though a painstaking attempt should be made to distinguish between spasm of the pylorus, a functional form, and true pyloric obstruction due to a thickened ring muscle, since the prognosis in the two varieties is so entirely different. In many instances, the symptoms of pylorus spasm are hard to distinguish from mechanical obstruction, it is true, but differentiation is possible in a certain number of cases. According to Pfaundler, simple spasm almost never ends fatally, if left alone; and, again, the later the symptoms appear, the better is the prognosis. In Escherich's clinic it was my privilege to observe two cases side by side. The one, a child of neurotic parents, was several weeks old when vomiting began. Its loss of weight was progressive, but not uniformly progressive. Daily weighing showed variations in the amount lost. It had occasional fecal movements. This case recovered, after a merely dietary treatment, without operation. The other case began vomiting six days after birth. The vomiting was forcibly

projectile in type. The loss of weight was constant and rapid. The urine and stools were most scanty. Operation showed a hard, thickened cartilage-like pylorus.

As to the occurrence of these cases, hypertrophic pyloric stenosis occurs almost without exception in patients under two months. Cases of pylorus spasm have occurred in children older than two months. The geographical distribution of these cases is not without interest. It seems to be a disease of the Anglo-Saxon race. Most of the cases reported have been either American, English, or North German. A few have been observed by Austrian writers. According to Heubner, no case has been reported in a Latin race.

DR. ISAAC W. KINGSBURY (Hartford): Dr. Arnold has brought forward a discussion upon which I purposely laid but little stress, because it involves a heated debate, the extreme views of which cannot be reconciled. One side as cheerfully denies the existence of the organic type as does the other side refuse to believe in the possibility of simple spasm. Thus Heubner, reporting forty-nine cases, all medically treated, with but two deaths, utterly denies recognition to the repeatedly established pathological findings of accepted authorities. On the other hand, certain surgeons, notably Scudder, are as loath to accept the pure nervous type mentioned by Dr. Arnold. Voelcker's statistics from the Great Ormond Street—thirty-nine cases with eighty-seven per cent. deaths—contrast strangely with Heubner's figures. Pfaundler, with his "systolic stomach" theory, was formerly as extreme as Heubner.

Omitting congenital atresia, pathologically we have three types of cases presenting symptoms of pyloric stenosis. (1) Simple spastic, in which the prognosis is good. (2) Purely organic, with an utterly bad outlook. (3) Organic hypertrophy, with a spastic element, the degree of which determines the prognosis. From a quite extensive review of reported cases, I believe the last type to be the commonest.

As regards the occurrence of the condition in the Latin and Slavonic races, I am of the opinion that they are not entirely exempt. If I remember correctly, one of the earliest cases was reported from Russia, and only last year Guillemot reported an autopsy from Paris. However, its rarity in these races is as remarkable as it is unexplainable.

Early Diagnosis of Spinal and Cerebral Tabes.

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For discussion, I have chosen the early symptoms and signs of tabes, which are so frequently overlooked. If recognized and properly interpreted, they enable us to make a positive diagnosis of tabes during its incipency. By so doing much can be done to relieve suffering and possibly to bring about an arrest of the morbid process; to settle certain medico-legal questions concerning criminality, the validity of a last will, or social questions pertaining to marital responsibility, professional and business capacity of an individual.

The greater the clinical experience, the more convincing is the opinion of Fournier that the two conditions, tabes and G. P. I., are one and the same condition attacking different parts of the central nervous system. Both conditions are a primary neuronc degeneration which may commence in almost any part of the central nervous system.

Clinically, we most frequently encounter the following types: spinal, cerebral and cerebro-spinal; less frequently the optic, and occasionally the medullary.

The term "tabes" means gradual, progressive wasting, and if we examine the brain of a patient who dies of G. P. I., or the spinal cord of a tabid, or the optic nerve of a blind tabid, the most striking change is the wasting.

Although there is a general resemblance between all cases of spinal and cerebral tabes, no two cases are alike, because no two individuals are of the same temperament, nutrition and habits, or the conditions of life under which they have lived, the combination of which has been the exciting cause of the degeneration.

Very little was known concerning the causation of tabes until Esmarch and Jessen called the attention of the profession to the frequency of an antecedent luetic infection in cases of

G. P. I. Little attention was paid to their observations. Fournier, in 1889, not only confirmed their observations, but pointed out that tabes and G. P. I. were one and the same condition affecting different portions of the central nervous system, and christened the condition *parasyphilis*. His views met with strong opposition by the profession and particularly by Erb of Germany, who is now one of the strongest advocates of the luetic origin of tabes.

Dr. Savage was the first English physician to call attention to the relationship of lues to G. P. I., while Gowers considers lues the principal, if not the essential cause of tabes. Mott and Ferrier advocate the luetic origin of both cerebral and spinal tabes, which they regard as one disease affecting different parts of the central nervous system. Erb, Morbeus and Mendal in Germany, Raymond and Regis in France, Gowers and Mott in England, have collected statistics and strongly support Fournier. It is now so generally admitted, with the exception of Von Leyden and his disciples, that lues is the principal, if not the essential cause of tabes, that it seems unnecessary to quote statistics.

According to Mott, the strongest argument in favor of the view that lues is the factor of all others that causes tabes, is the existence of a juvenile form, occurring only in subjects who have had congenital or acquired lues, and affecting both sexes equally.

Both cerebral and spinal tabes occur more frequently in men than in women (nine to one), and more frequently in the men of the higher classes, while women of the lower classes are more frequently victims, as negresses and demi-mondes; men who go abroad, as for instance, traveling men, sailors, soldiers, engineers, etc. Clergymen are quite exempt.

Tabes occurs both in men and women during the third and fourth decades of life, and only in those who have sown their wild oats ten or fifteen years previously. Occasionally it occurs as late as forty or fifty years after infection. Except in juvenile tabes, it does not occur before the thirtieth year of life. Hereditary predisposition is said to occur in only ten

per cent. of the cases, as the sufferers from this disease are the cultured of the urban communities who are vigorous in both mind and body. Individuals of Arab proclivities, i. e., those fond of the fair sex, supporting harems and contracting lues, are the victims of tabes. If, on the other hand, they escape infection, they escape tabes. Good eaters and drinkers, with a heaven consisting of gilded drinking halls as contrasted with the Arab harem, may degenerate into sots, but never develop tabes. Head injury, sunstroke, worry, lead poisoning, great and prolonged mental and physical stress, are undoubtedly powerful etiological factors in an individual tainted with lues.

Patients suffering from tabes consult a physician for one or more of the subjective symptoms, and not for any objective sign, as the pupillary changes, altered knee jerks or Rombergism. It is, therefore, important that we should be constantly on our guard for such symptoms as sensory discomfort, visceral disturbances, difficulty in locomotion, loss of sexual desire, sexual gluttony, testicular atrophy, etc. Pains are not only the most common, but they are the earliest indication in a vast majority of cases of tabes. About seventy per cent. will consult a physician for pains consisting of attacks of the so-called paroxysmal, lightning, fugitive, shooting, stabbing, lancing, vagabond pains. These pains are influenced by damp, cold weather, diet and emotional shock, etc.

Darting pains in the legs, coming on in paroxysms, are often thought to be rheumatism or sciatica. When shooting down the arms on the inner side, as they often do, associated with girdle sensations about the chest, they may be and often are mistaken for angina, or to pressure from an aneurism of the aorta. When they occur in the chest, they are often thought to be due to pleurisy or pleurodynia.

It should also be borne in mind that these patients are also subject to continuous pains, the so-called girdle pains, which may last for days, weeks, months, or even years. We occasionally meet with the so-called neuralgic, or Gowers neural type of tabes with preservation of the knee jerks. Dr. Buzzard, in 1887, made the statement that when one met with a case of

double facial neuralgia, to look out for tabes. In 1898, Gowers showed his first case, that of a woman, at the National Hospital for the Paralyzed and Epileptic, Queen's Square. Since then, he has met with nine other cases, all males.

It is surprising the large number of patients suffering with tabes who have run the gamut of anti-rheumatics for their pain, but steadily grew worse because the attending physician committed the sin of omission by not attempting to elicit the knee jerk or the pupillary reflex. A large number, ten per cent. of the cases, consult the oculist for failing vision of one or both eyes. They may complain of dimness of vision—objects look smoky, or as if a veil were in front of the eyes. One eye is usually affected much more than the other. On examination, it will be found that they have limitation of the field of vision, with failure of color vision, the red and green disappearing before the blue and yellow. An ophthalmoscopic examination shows a picture which resembles a harvest moon in a pink sky. The edge of the disc is sharply defined, of a grayish white or white appearance; the vessels may or may not be reduced in size, a condition which is known as primary optic atrophy.

Occasionally there is amblyopia without any ophthalmoscopic change. Quite frequently, optic atrophy is the very first symptom (six per cent.) and the patient may remain free from other symptoms for from ten to twenty years. In fact, some authorities consider it a favorable prognostic sign. In one case under observation the patient went ten years without developing any other signs or symptoms. He then developed bladder symptoms, and five years later, unequal knee jerks; three years later, rectal crises, the diagnosis of cancer being made by a surgeon who treated him with the X-rays. He then developed mental symptoms, and six months later committed suicide.

It should be borne in mind that the worry over the loss of sight may end in a mental breakdown (forty per cent., Mott). Another group of cases consult the oculist for double vision, due to ocular paralysis. The paralysis may involve one muscle,

the external or internal rectus of one side, ptosis of one or both lids, and at times a complete paralysis of the third nerve. The paralysis is usually transient, lasting from a week to several months, then disappearing, and at times showing a marked tendency to recur, and is occasionally permanent.

A number of patients will seek relief for bladder trouble. They may complain of difficulty in urinating, inability to start the stream due to detrusor weakness; or inability or difficulty in retaining the urine, as on any slight exertion, as coughing, due to loss of tone of the sphincter, allowing the urine to escape into the urethra, thus exciting the reflex, giving rise to an urgent desire to urinate.

Bladder crises was an early symptom in one case—patient, male, aged 38, complaining of a constant desire to urinate, but unable to pass any urine, associated with severe burning and cutting pains in lower extremities. He had lost sexual power one year previously and had suffered with testicular neuralgia for several months, with lightning pains, but paid no attention to them, as he believed they were rheumatic.

A number of patients seek advice for paroxysmal attacks of purposeless vomiting. The attack may be preceded by pain, or fullness of the epigastrium, with lightning pains all over the body, or a deep internal burning sensation. The severe attacks may last for hours, or even days, and terminate suddenly. The knee jerks are frequently found to be exaggerated, associated with complete or partial anæsthesia of the trunk, with a girdle sensation. The contents of the stomach is vomited and retching of mucus is continuous, just as in *mal de mer*, sometimes mixed with bile, blood or altered blood. These attacks may be accompanied by frequent purgation. At times they may simulate intestinal obstruction, but, on close observation, it will be found that the pupils do not dilate, while the patient experiences severe colicky pain, but remain unchanged. These attacks are supposed to be due to degeneration commencing in the mid-dorsal region. Intestinal crises are characterized by frequent watery stools, lasting for days, weeks or months, and ceasing spontaneously as suddenly as they appeared.

Rectal crises are frequently an early symptom. Patients come complaining of paroxysms of pain and tenesmus, of a feeling as if a hot iron were being thrust up the rectum. Such patients are frequently treated for piles or ulcer, and I have known of a patient so afflicted being treated for cancer of the sigmoid by the X-rays.

Laryngeal crises are frequently an early symptom of tabes from one to thirteen years before the other symptoms develop. They may consist of paroxysmal attacks of dyspnoea and spasm of the glottis, or they may simulate an attack of whooping cough or laryngismus stridulus, accompanied by a burning pain in the larynx and a feeling of suffocation. They may be accompanied by epileptiform seizures, or loss of consciousness. In these cases there is adductor spasm, due to abductor weakness, which may constitute a very grave complication. In some cases the spasm may involve the pharynx, making swallowing impossible.

In a very few cases a very early symptom is increased sexual appetite. This is quickly followed by impotency and atrophy of the testicles and anæsthesia of the genitals and a testicle can be compressed without the patient experiencing any pain.

A few patients consult the physician for inability to walk in the dark, particularly in going up or down stairs, swaying of the body while washing the face in the morning, or a sudden giving away of the legs while walking (the so-called Buzzard's sign).

A few patients seek advice for trophic changes, and the one most frequently encountered is the so-called perforating ulcer of the foot (*ulcus perforans* Charcot).

It usually starts as a calloused spot on the sole of one or both feet, which undergoes suppuration, forming a hole. It is a painless condition and will not heal, discharging a thin, foul-smelling, purulent fluid. This condition may lead to caries of the bones of the foot, or it may perforate through the foot. Another trophic condition, but not so frequently met with as the former, is the so-called Charcot joint. A patient will seek advice for pain or swelling of a joint, or, possibly, a disloca-

tion or sub-luxation unaccompanied by fever or inflammation. The joints usually affected are the knee, hip, ankle, shoulder, elbow, wrist, first metacarpo phalangeal or metatarso phalangeal joint. Even the spinal column does not escape.

Another condition is what is known as the tabid foot, the result of deformed tarsal bones, which gives rise to a shortening and thickening of the foot at the instep and flattening of the sole, with marked crepitation on movement.

In one case, the first symptom of tabes was a spontaneous fracture of the right thigh, middle third, which occurred in a female patient, forty-six years of age, on getting out of bed. On examination, she was found to have the characteristic pupils, absent knee jerks and marked blunting of sensibility of the lower extremities.

In a few cases, the first symptom for which we are consulted is epileptiform or apoplectiform attacks followed by transitory aphasia. In a short time, the characteristic signs of tabes develop, and for years the patient presents no other mental symptom; while in other cases *pari passu* with the cord symptoms, mental states, such as mania, melancholia or progressive dementia develop, often associated with grandiose delusions or delusions of persecution. The case is then one of tabo-paralysis.

In about ten per cent. of the cases of tabes the cord symptoms last for years, then the symptoms of G. P. I. develop. The cord symptoms become less evident as the mental symptoms become prominent. The existence of a knee jerk on one side and its absence on the other, in a case of tabes, is an unfavorable sign which always means cerebral destruction or degeneration, due to G. P. I. or syphilitic arterial disease.

As already stated, owing to the atrocious pains, worry from physical disability or failure of vision, patients may develop mania or melancholia with homicidal or suicidal tendencies, or they may become the subjects of hallucinatory paranoia. Such patients often put an insane interpretation upon their symptoms. They fancy the pains are due to electrical currents from concealed batteries applied to them by an enemy, gastric crises, to poison put in their food.

One case under observation, a woman, had the delusion that a certain physician cohabited with her every night, and the frequent repetition of the act was responsible for her difficulty in walking. Men, when suffering from impotency, develop the delusion that their semen is being drawn from them by some imaginary person at night while they are asleep.

In considering the early symptoms of cerebral tabes (G. P. I.), it should be borne in mind that there are several clinical types of onset of the disease.

For convenience they may be divided into two classes: the so-called hospital cases, or motor types, and the asylum cases, or mental types. The former class is characterized by a predominance of motor symptoms, with a slight or moderate degree of mental deterioration; the latter are characterized by the obtrusiveness of the mental symptoms, convulsions, mania, melancholia, dementia, etc.

Two varieties of the motor type are met with in practice—the spastic and the ataxic. The spastic type is characterized by a dull, fatuous countenance, irregularity of the pupils, sluggish reaction to light or an Argyll-Robertson pupil, facial tremor upon voluntary or emotional movements, tremulous tongue, slurring speech, tremor and powerlessness of hands, tremulous and altered handwriting, unsteadiness of gait (the spastic), exaggerated knee jerks, fleeting ankle clonus and Babinski's sign.

The ataxic type is characterized by ataxia, absent or unequal knee jerks, "shuffling gait" and sometimes perforating ulcers on the soles of the feet. An investigation into the mental state will show a loss of memory for recent events, a slight dementia, varying in degree up to the typical asylum case ("the fluid mental state").

The mental state is easily understood if we remember that the disease is a shedding of the higher and latest acquired functions of the mind, and as the process goes on in proportion to the destruction of the cortical elements, there is a progressive dementia which is the most constant symptom.

Epileptiform convulsions, the so-called "congestive attacks," accompanied by temporary, partial or complete loss of consciousness, followed by transitory aphasia, amnesia, word blindness or word deafness, lasting for hours, days or a week or two, is often the first indication of the disease in a number of cases.

At times these attacks are so slight as not to attract attention ("blanks or forgets"), (Hughlings-Jackson's attacks).

It occasionally happens that they are of frequent occurrence and lead rapidly to profound dementia and death. The severer attacks may and often do simulate apoplexy. Such a diagnosis is often made and the friends of the patient are informed that he will not recover, but to the great surprise of all concerned, within a day or two the patient is sitting up, and within a week or so he is quite himself again. A few of these cases develop hyperpyrexia, and when they occur in foundry men or during the summer, may be mistaken for heat or sunstroke, also for uræmia, strychnine poisoning, essential epilepsy and hysteria.

The mental state of an individual is constantly and rapidly changing, therefore, the ego of one moment is not the ego of the next. This change in health depends upon bodily conditions, temperament, environment, etc.

It is at once quite apparent that no fixed mental standard can be established, so we are compelled to compare an individual's present character with his past in order to determine what, if any, alterations of the feelings, emotions and intellect have taken place.

It is quite evident to the skilled observer that every passing feeling is reflected in the face, which has led to the expression "The face is the mirror of the soul." It is only the fond mother, loving wife or the dearest friend who can detect alterations of the feelings or emotions. They have known the individual as he was and as he is, yet the physician who has had considerable experience with this disease may, from a study of the facial expression, suspect its existence, and if the patient's speech does not betray him, by further inquiry, or by the detection of the physical signs, his suspicions will be confirmed. The

individual usually consults a physician for nervousness or sleeplessness.

The wife, business partner or close friend has noticed a change of character.

The individual was previously kind, affectionate, considerate, of an even temperament and happy disposition. He has now become subject to fits of sudden violent temper, of a sullen disposition, morose, despondent, neglectful of his duties and family, worries over trifles, loses self-reliance, consults others about trifling matters. He is restless, irritable, easily excited over trivial things. He has become a victim of many moods. He is unable to fix his attention on any subject for any period of time. At times he develops morbid suspicions, which later may become fixed delusions of persecution.

The delusions or fits of violent temper may compel him to commit suicide or homicide; while another individual gives way to amusements, gambling, immorality, vice and intemperance. These patients are at times careless about their personal appearance, untidy in their dress, forgetful of business and home affairs. They often become involved in ambitious schemes which amount to nothing. They frequently develop attacks of mania and melancholia.

From this it is apparent that the disease is a progressive mental enfeeblement, with motor weakness ending in dementia, which characterizes the disease.

One of the most important signs of tabes is a condition of the pupil first described by Argyll-Robertson in 1869 and universally known as the Argyll-Robertson pupil, i. e., a pupil that reacts promptly to accommodation but does not react to light or pain (with or without myosis).

This condition of the pupil is usually present in both eyes, but it may be present in one eye and not in the other. Erb was the first to point out the frequency of this condition in tabes. About eighty per cent. of the cases of spinal tabes and about seventy per cent. of the cases of cerebral tabes have Argyll-Robertson pupils, while the remaining cases have sluggish pupils, or irregularity of the pupils. The pupil may be

angular, elliptical, oval, or eccentrically situated (the Piltz pupil). This condition often precedes the development of the Argyll-Robertson pupil.

Piltz, Joffroy, Shrameck, Babinski, Mott and several others claim that every alteration in the form of the pupil (excluding congenital anomalies and synechiæ) signifies syphilis or parasymphilis.

Absence of the knee jerks is an early sign in a majority of the cases of spinal tabes, but in a certain number of cases with optic atrophy, ocular paralysis or gastric and intestinal crises, the knee jerks may be present and are often exaggerated. The same rule applies to cervical or arm tabes. In some cases the knee jerks have disappeared, first on one side, then on the other, after an attack of atrocious pains in the legs.

The knee jerks may be absent on one side and exaggerated on the other side. This condition may be explained by the fact that the nerve roots connected with the sensory innervation of the quadriceps extensor muscles have not been destroyed on one side, or it may be due to progressive degenerative changes occurring in the opposite cerebral hemisphere.

In cerebral tabes (G. P. I.) the knee jerks are exaggerated as a rule (except in the cerebro-spinal or tabetic form of (G. P. I.), when there is simultaneous cerebral and spinal degeneration.

Disturbances of cutaneous sensibility to light tactile impressions, to pain, heat and cold, are often found. One of the earliest and most constant signs of tabes is the cutaneous trunk anæsthesia, affecting the third, fourth and fifth dorsal segments, and may involve other segments above and below as the disease advances (Laehr, Bonar, Patrick's sign). The anæsthesia may extend down the ulnar side of the arm and hand, giving rise to loss of sensibility on compressing the ulnar nerve at the elbow (Biernacki's sign). Sensory disturbances also occur on the outer side of the leg and the soles of the feet (Sarbo's sign). Sensory disturbance also occurs in the popliteal space, known as Bechterew's sign.

These areas of blunted sensibility are closely related to the visceral disturbances, as they are often associated with or occur after the attack passes off. They often occur with or after attacks of atrocious pains.

Loss of sensation of passive movements in joints is often an early symptom, according to Frenkel, in cases of spinal tabes.

Last, but not least, as a valuable clinical means of ascertaining whether or not an individual is suffering from tabes, is a cytological examination of the cerebro-spinal fluid, which may be obtained by means of a lumbar puncture. The fluid which is drawn by this operation is centrifuged, and, if a deposit is obtained, it should be microscopied, and if found to consist of lymphocytes and plasma cells, it points to either syphilis, tabes or tuberculous meningitis; consequently all doubtful cases can be cleared up by this simple operation.

DISCUSSION.

DR. ROBERT E. PECK (New Haven): The diagnosis in advanced cases of tabes, showing a number of the typical symptoms, is not a difficult task, but in the early stages of the disease, when there are few of the characteristic symptoms present, the importance of making a careful and painstaking study of all cases showing the lightning pains, dimness of vision, paræsthesias and gastric crises, cannot be too strongly emphasized. Too often such cases are treated for rheumatism, malaria and neurasthenia, and much valuable time lost in instituting appropriate treatment and adapting such means as will tend to stay the progress of the disease.

In a recent issue of the *British Medical Journal*, Bramwell published a very valuable analysis of some 263 cases of tabes. Let me call your attention to a few important points in this analysis.

Seventy-three per cent. of the cases occurred between the ages of thirty and fifty.

The largest number (seven and two-tenths per cent.) of any one class was among housewives and those living at home. After this those most frequently affected were engineers, clerks, laborers, commercial travelers and physicians.

The existence of some form of venereal disease was practically certain in eighty-two per cent. of the cases.

Of the greatest importance, however, is the character of the first symptoms: Lightning pains alone, fifty-one and five-tenths per cent.;

diplopia and dimness of vision, seven and seven-tenths per cent.; ataxia, six and four-tenths per cent.; lightning pains and ataxia, five and four-tenths per cent.; derangement of urination, gastric crises and numbness of the feet occurring in the order named.

I have had under observation, for the past dozen years, a case of tabes affecting the left side only, which I have never reported but which illustrates the point in question.

M. S. Married. Sixty-two. About twenty-five years ago patient was seized with a severe, dull, continuous pain in the back of the neck, which lasted for several weeks. A diagnosis of malaria was made and the patient sent away into the country for the summer. After the pain ceased she began to have a numbness in the hands, which gradually extended all over the body. This numbness was accompanied by a general muscular weakness, which was sufficient to confine the patient to her bed for three months during the following winter season. During a portion of this period she was unable to feed herself. Gradually muscular power returned and she was able to be about again, using arms and legs. The following fall, one and one-half years after the onset of the pain and numbness, she began to have lightning pains in arms and legs and soon developed ataxia and incoördination on the left side only. At this time a diagnosis of tabes was made.

When I first saw her, some ten or twelve years later, there was well-developed ataxia and incoördination, on the left side, contracted pupils, the Argyll-Robertson phenomena, complete loss of knee jerk and ankle clonus, lightning pains in arms and legs and at times vesical incontinence. The right arm and leg, however, was not involved and the patient was using the right hand in writing, sewing and for some of the most delicate and beautiful embroidery work.

DR. MAX MAILHOUSE (New Haven): After practically what might be called a book on this affection, which we have just heard, and also considering the fact that one recent author on diseases of the nervous system has devoted one hundred pages to tabes, five minutes is a very short time in which to discuss its common and important features.

One of the most common experiences of the neurologist is to have cases of tabes referred to him by the oculist who first has been consulted for either diplopia or some loss of vision. That is a very common event, and perhaps the oculist sees the affection almost as frequently as the neurologist himself.

I will not speak of paresis, because these cases more generally come into the hands of the alienist, or to the general practitioner who refers such cases to the alienist, than they do to the hands of the neurologist, unless they develop in the course of tabes itself.

Now then, as to the diagnosis of tabes, it is important to bear in mind and be prepared to properly interpret the subjective symptoms.

As Dr. Lynch has well said, the pseudoneuralgic pains or the neuralgic pains, are, perhaps in a larger proportion of cases than he has stated, perhaps in as many as ninety per cent., usually the first symptoms; and the physician must be on his guard, and absolutely exclude other causes of the pains, otherwise he will go astray. And it should be a standing rule that the physician, in all cases of pains which seem to be muscular rheumatism or neuralgic, make a test for the Romberg symptom of the knee-jerks, and inquire into the condition of the bladder. A not infrequent early symptom is the giving way of the knees, which comes when the patients wash their faces and the eyes are temporarily closed; they are inclined to give way just as in the case of going upstairs in the dark. Cases of rectal and of laryngeal crises, I think, are not very common. They have not been common in my experience, which is not small. They do occur, and we should bear those facts in mind.

The cases of gastric symptoms are due to disturbances in the pneumogastric nerve, however, and I believe are much more common and are very frequently unrecognized. Here again the general rule should hold, that in cases of gastric disturbance where the cause is not absolutely clear, investigation should be made into the condition of the bladder and reflexes. So, too, with disturbances of the bladder. Among elderly people the disturbances of the bladder should not be solely attributed to one cause. At any rate, examinations of the person for evidences of tabes should be made before further procedure is undertaken.

Perforating ulcer may be the first symptom. I recollect one case that came into my office simply because he had two sores, one on the ball of each great toe. They were the first thing which called his attention to the necessity of consulting a physician, and an after examination revealed characteristic objective phenomena of tabes.

I think one of the deep reflexes which ought to be examined into as frequently as any, is that of the Achilles jerk. Sometimes this will be found feeble, or wanting, before knee jerk is affected. That should be examined into in every case. Sometimes there will be a difference on the two sides. Then, too, the pupillary reflexes must be examined very carefully. It is very easy to be mistaken in the question as to whether the pupils react to light or not. And the trick of having the patient look out of the window and then look toward the dark portion of the room, when the pupils re-dilate to their normal condition, should be thought of.

DR. JOHN C. LYNCH (Bridgeport): I must confess that I did not have sufficient time to finish the early symptoms of cerebral tabes or G. P. I. (i. e., general paralysis of the insane).

I have collected statistics and drawn conclusions from the school in which I was taught. Naturally, therefore, I have looked upon tabes

and G. P. I. as one and the same condition, affecting different parts of the central nervous system. Very frequently we meet as the first symptom of tabes a primary optic atrophy, and the case may go on as one of spinal tabes or G. P. I.

Again, we will find a certain number of G. P. I.'s, that is, they start off with all the symptoms of G. P. I., and they die with symptoms similar in every respect to those met with in locomotor ataxia. I recall one case in particular. (Dr. Diefendorf saw the case with me.) He had all the early symptoms and signs of G. P. I. Several attempts were made to have him committed to Middletown, but failed. He afterwards developed symptoms of locomotor ataxia and died in the Bridgeport Hospital without any mental symptoms except a very slight dementia.

Again, we meet both conditions combined with unequal knee jerks and associated cerebro-spinal symptoms, so it would seem to me that there is but little doubt that the two conditions are the same.

The most conclusive evidence, however, is the pathological findings. The nerve roots and the posterior columns of the spinal cord show a marked wasting in locomotor ataxia, while if we examine the brain of the G. P. I. we will find the convolutions of the brain wasted, the pia opaque and thickened, showing practically the same changes as we find in the spinal cord, a degeneration of the upper motor neurons and the lower sensory neurons. Of course, some authorities claim both diseases are primarily vascular, i. e., the primary change occurs in the blood vessels, while other authorities, such as Mott, Gowers and Ferrier in England, Erb in Germany, Raymond and Regis in France, believe it to be a primary neuromic degeneration.

Recent Progress in Exact Diagnosis of Aural Brain Complications.

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In the otological literature of the last five years very much more space has been given to the complications of aural disease than to aural disease itself. Otologists are now trying to forestall brain complications by operating much earlier and oftener than before. Is early selection of the cases which should be operated on possible, or are we operating unnecessarily?

Most observers agree that infection of the antrum and the mastoid cells accompanies almost every acute infection of the middle ear. Most of the cases, however, get well without surgical interference. Close study usually reveals whether the infection is progressing or receding, though one cannot always be sure. For example: In a recent case of acute otitis media, the discharge ceased on the second day, but the mastoid continued tender and its periosteum very slightly thickened for *five weeks*. During this time there was occasional severe pain in the mastoid, and the drum membrane did not become white, though the hearing was good, the vestibular apparatus normal and there was no temperature. As the process then showed no signs of clearing up, on April 15, 1908, I opened the mastoid cells and curetted the antrum, both of which were infected. Recovery was normal. *After* the operation it was evident that an earlier operation would have saved time; though of course it is among the possibilities that the patient might have gotten well sometime without operation.

Red, swollen and tender mastoids have long been recognized as fit cases for surgical interference. We were later in recognizing that there is a class of cases without redness, tenderness and swelling, in which the mastoid nevertheless contains pus; and that these are largely the cases which have brain complica-

tions, or will have them later. Indeed, an actual majority of the cases of brain infection of otitic origin come without redness, swelling and tenderness of the mastoid process—the external table being too thick and dense to allow these symptoms, the internal table offering a much easier path for the pus under pressure to escape to the brain. To pick out these cases exact methods are necessary.

Much more attention is being paid to labyrinth symptoms than formerly, for it is now appreciated that the involvement of the labyrinth in the infective process means not only destruction of hearing, but the probability of intracranial infection later. The labyrinth is a not infrequent path from middle ear infection to brain infection; indeed, infection of the posterior fossa usually comes in this way. To have an end-organ in the path of suppuration is of course a disadvantage to the patient, but it helps in diagnosis, labyrinth involvement giving distinct symptoms. Thanks to the various tuning fork methods, and to the work on vestibular nystagmus done by Dr. Barany and confirmed by Dr. Neumann of Politzer's clinic (both of them careful investigators), it is now often possible to localize the trouble precisely in the inner ear. The general term "inner ear affection," like the old term "Bright's disease," comprises several distinct diseases.

When the labyrinth is infected, both end-organs, the cochlea and the vestibular apparatus (the latter including the saccule and the semicircular canals), are usually affected, though either one *may* be affected alone. If the infection invades the cochlea, there is inner ear deafness, in addition to the usual middle ear deafness from the changes in the conducting apparatus caused by the suppuration. Inner ear deafness is the only symptom of cochlear disease; it may be total, or for some tones only, and is often associated with lessened bone conduction. Tests for the cochlea are: Distance at which patient hears the ordinary voice, whisper and watch; is watch on mastoid heard; if the hearing is bad, does he hear whisper through six-foot tube, for he must hear this if he hears at all with that ear; the loud voice close to the ear is an uncertain test, it being easily

carried through the bone to the other ear; are the low, medium and high tuning forks heard through air (the high C_4 fork being struck very lightly); using low and medium forks, compare air and bone conduction in the same ear (Rinne); compare bone conduction with one's own as normal (Schwabach); in which ear is the fork on the forehead heard best? By these tests the amount of function in the cochlea is determined.

The symptoms of affection in the vestibular apparatus are dizziness, disturbance or loss of equilibrium, and nystagmus. By nystagmus is meant short jerking movements of the eyes, rapidly repeated and in the same direction, usually horizontally. Nystagmus of ocular origin is slow and regular; ear nystagmus has a quick and a slow component. Nystagmus is named from the direction of its quick component, thus being ordinarily either to the right or the left, or, as it is more usually named, to the diseased or to the sound side. Spontaneous nystagmus is readily observed by anyone, if it is present, when the patient is made to direct his gaze as far as possible first to one side, then to the other, following the finger of the observer. In normal persons there is either no nystagmus or a very little, equal to both sides. In affections of the vestibular apparatus, there is nystagmus to the side which sends the strongest impulse; so irritation of one vestibular apparatus gives nystagmus to that side; destruction of one vestibular apparatus gives nystagmus to the other side. These three vestibular symptoms (dizziness, disturbance of equilibrium and nystagmus) pass away in time; then the disease of the vestibular apparatus is no longer manifest. But dizziness goes first, disturbance of equilibrium next, and nystagmus last; so if dizziness outlasts nystagmus, it is not aural dizziness.

The tests for equilibrium are well known: such as to walk a chalk line, to run backward, or, better, to hop backward on one foot, and Romberg's test; all of course with the eyes closed. The normal man has impulses from the vestibular apparatus of both sides when he makes these unusual motions; but if one

side is gone, or very severely irritated, he has impulses from the other side only ; so, knowing only one side, he falls.

The tests which bring out nystagmus are whirling, syringing with hot or cold water, and electricity. If a normal person is whirled rapidly about on a revolving stool, the head being bent well forward, there is dizziness and nystagmus on stopping, on looking in the direction opposite to that of the whirling, after about ten turns. Twenty turns give nystagmus *also* on looking in the same direction as the whirling. Fifty turns, perhaps, will give nystagmus *also* when the patient looks straight ahead. This is about the average, though the number of turns necessary to produce nystagmus differs greatly in different people. If the vestibular apparatus is irritated, fewer turns cause nystagmus and dizziness. If one vestibular apparatus is destroyed, turning to the opposite side produces nystagmus, turning to the same side produces none. Whirling affects the vestibular apparatus of both sides at the same time. The nystagmus is affected by the direction of the turning, by the number of turns, and by the position of the head. If the vestibular apparatus is irritable, syringing with cold water decreases the nystagmus to that side ; syringing with hot water causes dizziness and increases the nystagmus to that side. The galvanic current causes nystagmus to the side to which it is applied, but it is uncertain as a test, because it may act through the nerve trunk after the end-organ is destroyed.

Nystagmus induced by labyrinth disease is directed first to the diseased side. As the labyrinth disease progresses and diminution of vestibular irritability ensues, the nystagmus goes to the sound side and remains till the diseased labyrinth is entirely gone. While nystagmus to the diseased side continues, the irritability of the labyrinth is normal or increased ; but when it turns to the sound side finally, the irritability of the labyrinth is already diminishing. When irritability of the vestibular apparatus is lost, there is then no vestibular nystagmus to that side, and no dizziness or nystagmus can be produced by syringing that ear with hot or cold water. To recapitulate briefly : Spontaneous nystagmus is to the diseased

side at first from irritation, later to the sound side if the function is badly injured or destroyed, or gone in old cases. If there is no nystagmus, either the vestibular apparatus is normal, or it was destroyed so long ago that the nystagmus has disappeared.

Nystagmus from the vestibular apparatus is constant within the above limits, and is influenced by vestibular irritation, such as syringing, whirling and electricity. There is another kind of nystagmus, that of intracranial origin, which differs from vestibular nystagmus in that it changes without apparent reason in quality, in intensity and from side to side, but is not influenced by manipulations on either vestibular apparatus.

There are three forms of labyrinth affection:

I. New formed tissue, especially at the round window, as in old middle ear suppuration. This gives shortened high tones, later, shortened bone conduction also, so that watch on bone is not heard. The vestibular apparatus is normal. It is characteristic for labyrinth disease secondary to middle ear suppuration to hear the medium fork well, and not to hear the high and low forks at all.

II. Inflammation which gives vestibular symptoms in addition to the cochlear deafness of the first form. The mildest trouble is an irritation from the toxins from a focus of suppuration in the middle ear. This is indicated by lack of hearing for high tones and by dizziness and nystagmus to the diseased side. The vestibular apparatus remains irritable. Later, either the process stops, the nystagmus disappears, and the patient regains his hearing; or, it goes on to actual infection. When it occurs with chronic middle ear suppuration, because it may go on to labyrinth infection, it is an indication for prompt drainage of the suppurative focus. A more severe form differs from the preceding in that at one stage the patient is totally deaf and vestibular irritability is lost, the nystagmus going to the sound side; still, complete recovery may take place.

III. Labyrinth suppuration. This is either *diffuse*, when it affects the whole end-organ, or *circumscribed* in a part of the

labyrinth only. In diffuse labyrinth suppuration, the whole end-organ is destroyed; so the symptoms are absolute deafness, attacks of dizziness, and loss of vestibular irritability. There may be vestibular symptoms at first, later none. The nystagmus remains to the sound side for awhile, then disappears, but never returns to the diseased side. The outcome is permanent deafness and loss of vestibular irritability, the other symptoms gradually fading away. Unless the suppurating labyrinth is drained by surgical interference, it often leads to brain infection through the internal auditory meatus.

Circumscribed labyrinth suppuration is limited to a part of the labyrinth only. When it occurs in the cochlea, the only symptom is profound deafness. The vestibular apparatus remains irritable and there are no vestibular symptoms. This form is rare. Still more rare is the form in which the vestibular apparatus is infected and the cochlea not, i. e., chronic circumscribed labyrinth suppuration. In this form the hearing is good, for the process is limited to the vestibular apparatus, which is irritated but not destroyed, i. e., it remains irritable. It is called manifest if symptoms of vestibular irritation are present (attacks of dizziness, bad equilibration and nystagmus to the diseased side). It is called latent if without vestibular symptoms. There are also signs of fistula to the labyrinth. This is diagnosed by producing (or changing) nystagmus and dizziness by compression and rarefaction with the Siegel otoscope; with compression nystagmus is to the compressed ear; with rarefaction it is to the sound ear. If evidence of fistula is not found, diagnosis cannot be made till the process spreads to involve more of the labyrinth, and so give symptoms of a diffuse instead of a circumscribed affection. This chronic circumscribed labyrinth suppuration is the only form of labyrinth suppuration possible if the hearing is good.

Acute circumscribed manifest labyrinth suppuration differs from the chronic only in that the patient is deaf; here, if the deafness is old, the distinguishing mark is gone and it may be in either form.

Labyrinth suppuration, while uncommon in children, does not seem to be so rare in adults as it has been considered since it has been looked for exactly.

Labyrinth disease *usually* shows affection of the vestibular apparatus, is connected with loss of equilibrium, and the patient falls to the opposite side. Cerebellar disease is connected with loss of coördination, and the patient falls to the same side. In pure nerve affection, the vestibular apparatus is normal, i. e., there is nothing but the deafness.

Besides labyrinth symptoms, there may be other indications of coming trouble, especially in the chronic cases. All cases of chronic middle ear suppuration should have thorough persistent treatment, the basis of which is cleansing and good drainage. A certain number of those which are not thereby cured are liable to develop brain complications. These can be prevented by early operation. Such cases usually show one or more of the following conditions: Pus aspirable after cleaning; dead or rough bone in the tympanic cavity or attic; atresia; cholesteatoma, recognized by its peculiar odor and by the presence of cholesterin crystals in the sediment of the washings from the ear; labyrinth involvement; and acute or chronic mastoid disease. One should look for all these in cases of chronic suppuration, for these give the indications for operation *before* brain infection develops.

The following case illustrates this. A boy of sixteen had a profuse fetid discharge from the left ear for eight years, but could still hear ordinary conversation at ten feet with that ear. The other ear was normal. There were no mastoid or other symptoms. Persistent treatment, daily, for weeks at a time on several occasions in the last six years, only lessened the amount of the discharge a little. For the past three years I have seen him about twice a month, to remove granulations and make sure that some sort of drainage was maintained. Because of the good hearing, I hesitated to operate; but on March 11, 1908, I did a modified radical operation. The external mastoid wall was thick and extremely dense and hard. The antrum contained pus and a cholesteatoma three-fourths of

an inch in diameter. The external auditory canal and the antrum were thrown into one large cavity, skin flaps from the membranous canal made and packed in place through the meatus, the external wound being sewed up. The middle ear was not disturbed on account of the good hearing, a bridge of bone protecting the ossicles being left. After two weeks in the hospital he came to the office for further dressing, it requiring five weeks for the cavity to become completely lined with skin. There was still a slight discharge from the old perforation in the membrane. The hearing is the same as before operation. It is extremely probable that some time the cholesteatoma would have caused perforation to the dura and a brain complication, which is now prevented.

When brain complications have already come, an early exact diagnosis leads to a simpler and surer operation. In this diagnosis one is helped not only by the symptoms which the complication itself causes, but by labyrinth symptoms and by a knowledge of the usual ways in which brain complications come. The infection may extend to the brain by preformed ways, such as the facial canal or the labyrinth and the internal auditory meatus; it may extend through destruction of bone by pressure of cholesteatoma (which is the largest single cause of brain complications); or by caries of bone from suppuration; it may go perhaps via blood or lymph vessels. Most frequently it goes through the mastoid back to the sinus; or up through the roof of the attic and antrum to the middle fossa; or inward through the posterior wall of the pyramid, if this is pneumatic; or through the labyrinth. It enters the labyrinth usually through the round or the oval window. If it goes out via the nerve sheaths of the facial or auditory nerve, or via cochlear aqueduct, it goes to the intradural spaces and usually produces lepto-meningitis; if it goes out via the aqueductus vestibuli to the extradural spaces, extradural abscess is more usual. Pressure destruction from cholesteatoma is slow and leads to extradural and brain abscess and sinus infection rather than to meningitis. The infection is more apt to be circumscribed and walled off, the slower the

entrance of the infection, the lower the virulence of the infecting germ, the greater the resisting power of the patient, and the more of a fibrin producer the germ is. The pneumococcus, streptococcus, mucosus and capsule germs in general are such fibrin producers; while streptococci of high virulence and anærobic bacteria do not produce fibrin, but tend to spread rapidly to a general lepto-meningitis rather than to cause a walled-off process. Blood count gives evidence concerning the presence of pus and the resisting power of the patient. Lumbar puncture sometimes gives definite evidence, but its advisability is not yet fully determined.

The first symptoms of brain complications in general are headache, nausea and vomiting, and general depression; perhaps pain in the ear and mastoid. Any of these symptoms in a patient with a running ear should excite suspicion; and yet they are so often produced by other causes that suspicion of brain infection is *not* aroused, and this time at which many of the most valuable localizing symptoms appear goes by. One ought to observe the nystagmus, roughly test the hearing, note the character of the pulse and the vomiting, look out for chills, and keep an accurate record of pulse and temperature. It is not enough to know that the patient had fever yesterday, without knowing how much, and whether he had any this morning, or whether the temperature was subnormal. Later there may be little opportunity to study the case; the patient may be stupid or comatose, and all one may be able to do is to operate, if necessary, without much hint as to where to go or what may be found. A minute record of symptoms may make all the difference in the world to the patient. But the search for possible intracranial symptoms must have been exact, or it is of little use. No single symptom is definite; it is the symptom complex upon which exact diagnosis is based.

The following six cases of brain complications illustrate some of the facts as they occur, entirely independent of our theories:

A Hungarian woman of twenty-three was admitted to the Bridgeport Hospital, June 27, 1907, complaining of intense

pain in the right side of the head of one week's duration. She had a chronic suppurative process in the right ear, with slight but very fetid discharge. The drum membrane was gone and the tympanic cavity filled with cholesteatomatous masses. No pus was aspirable after cleaning. The canal was not swollen, and there were no mastoid symptoms. There was pain on percussion of the skull, especially in the right temporal region, intense dizziness on sitting up and on use of the Siegel otoscope, and nystagmus to both sides, most to the sound side; right ear absolutely deaf and vestibular irritability lost. No optic neuritis or involvement of the cranial nerves, except that she moved the head with difficulty; coördination a little uncertain; knee jerks diminished; urine normal; leucocytosis 17,000; polynuclears seventy-seven per cent.; large mononuclears seventeen per cent.; temperature and pulse on admission 104.6 and 96. Morning and afternoon temperature and pulse for the next three days were:

102.4	103.6	100	101.2	99	103.6
80	100	90	100	60	56

On the third day the pulse became slow, and a short period of semiconsciousness interrupted her continuous restlessness and noise.

The diagnosis of extradural abscess in the middle fossa was made from the localized headache and pain on percussion and the absence of basilar and posterior fossa symptoms; extradural abscess coming oftenest from direct extension from carious bone or cholesteatoma to the middle fossa over the attic or antrum, or to the posterior fossa behind the pyramid or around the sinus. Labyrinth suppuration with fistula was also diagnosed. I did a radical operation on the third day. The mastoid was very hard, the antrum deeply placed and filled with pus. A fistula to the lateral semicircular canal at the prominence in the antrum was enlarged for drainage. On entering the middle fossa an extradural abscess holding about a drachm and a half of pus was found over the tegmen tympani and antri, which in one spot were softened and necrotic, though no actual

fistula was found. The meningeal symptoms subsided on the second day after operation, and the temperature reached normal on the seventh day. Four days later the patient eloped from the hospital. Five months after this, when I chanced to see her through the kindness of her physician, there was a cicatrized opening behind the ear, at the bottom of which was some cholesteatomatous epithelium and a little moisture.

A woman of thirty-five came to the office on April 4, 1908, for relief of supposed ocular headaches. She had a chronic suppurative otitis media, and had had pain for six months behind the left ear. As the mastoid was slightly tender and there were symptoms of labyrinth irritation, she was sent to the hospital for observation. In the next five days the hearing for the watch dropped from ten inches to one inch, and dizziness and nystagmus to both sides, most to the sound side, were present. There was no fever; pulse normal; no other symptoms. Though the mastoid was not red or swollen and but slightly tender, because of the increasing symptoms of labyrinth irritation and the persistent pain, I opened it, and found the antrum full of pus and a large eroded opening through its roof leading to a circumscribed mass of granulations on the dura, i. e., an extradural abscess, with so large a fistula to the antrum that it gave no symptoms but the persistent pain. All the symptoms disappeared after operation and the patient is making a normal recovery. The diagnosis in this case might have been *suspected* from the pain, but we did not suspect it, and but for the labyrinth symptoms might not have operated.

Cerebellar abscess comes oftenest from labyrinth suppuration and from cholesteatomata. It may show no symptoms, or those of infection of the posterior fossa *plus* lack of coördination. Hemiataxia and hemiparesis of the same side and bulbar speech may come later. The stiff holding of the head, the pain in the occiput or forehead, the quiet constantly maintained position in bed, the slow pulse and subnormal temperature it shares with extradural abscess of the posterior fossa. The dizziness and the cerebellar nystagmus may be confusing when the laby-

rinth is involved also, though they may make the diagnosis certain, as they should have done in the following case.

A girl of seven was brought to the office on June 17, 1907, with a large fluctuating abscess behind the right ear. The mother said that the ear had never run, though it had smelled badly for six months. Up to eight days before the child had seemed perfectly well; since then she had pain in and behind the right ear, high fever, vomiting, loss of appetite, headache, and had lost considerable weight. Besides the swelling, the whole right mastoid was tender, the posterior cervical glands enlarged, and the neck stiff. The canal was very small from swelling and prolapse of its upper bony wall, and was filled with fetid debris. The right ear was absolutely deaf. There was a slight nystagmus to the diseased side. During the examination there was projectile vomiting. The patient was sent to the hospital, where the temperature on admission was 104.2, pulse 108. The mind was clear, there were no more chills and no more vomiting, but frontal headache and great thirst. Diagnosis, mastoid abscess and labyrinth suppuration. On June 19, 1907, I operated on the right mastoid. About half an ounce of pus was found outside the bone. The periosteum was gone and the bone softened in a small spot over the antrum, but no fistula to the antrum was found. The antrum was greatly enlarged and filled with cholesteatoma. Its roof and that of part of the attic were soft and were removed, but the dura was healthy and was unopened. Following the pus backward, the sinus was exposed and found covered with fibrin; on incision it seemed healthy. Anterior to it was a fistula to the posterior fossa, from which about a drachm of pus was evacuated. This opening was enlarged and a cerebellar abscess was found. The cochlea was opened at the promontory and more cholesteatoma curetted out. The horizontal semicircular canal was also opened at the prominence for drainage. A complete radical operation was done with skin flaps, and the wound packed. For three weeks after the operation the afternoon temperature was about 100, morning normal; the pulse ranged from 80-110. The only symptoms

were those of slight meningeal irritation. Then the temperature became subnormal, frontal headache, vomiting and signs of a basilar meningitis became prominent, and the patient died on the forty-second day after operation. No autopsy was allowed. We ought to have diagnosed the cerebellar abscess before operation, since nystagmus to the diseased side with the labyrinth destroyed could only have been intracranial nystagmus from infection in the posterior fossa.

Sinus infection is one of the commonest of the brain complications. The two following cases illustrate two stages in the same process:

A man of forty-one, who had had a running ear for one week following tonsilitis, was sent to the office because of a tender mastoid and a little occipital headache. He had a little dizziness and spontaneous nystagmus to the diseased side also. The mastoid was not red or swollen and there was no swelling in the canal. Discharge profuse; hearing voice at one foot. Three weeks later the conditions were the same, except that the upper and posterior walls of the bony canal were slightly swollen, the nystagmus was to both sides, and the hearing for the voice had dropped to four inches. After another week the nystagmus was mostly to the sound side and the dizziness and pain in the occiput were slightly increasing. The mastoid showed no symptoms except the slight tenderness. The man was about and had no fever or any other symptoms. Leucocytosis 16,000, polynuclears seventy-four per cent. As the process seemed headed the wrong way, two days later, April 30, 1908, I opened the mastoid, which was thick and hard. The antrum contained pus and granulations, as did some of the deep cells. Following softened bone backward, another pocket of pus was found around the knee of the lateral sinus, the sinus wall being protected by granulations. By exposing an area of sinus, one-half by one inch, normal dura was reached on all sides and the wound was packed. Recovery with normal hearing followed.

It was a coincidence that within a week the following case should appear, illustrating the condition towards which the

case just described was progressing. A Hungarian man of twenty-five was admitted to the Bridgeport Hospital on May 5, 1908, with a temperature of 104. No history was obtainable. The right elbow joint was red, and passive motion of it or of either shoulder caused pain. The right ear showed a profuse dark stinking discharge. The mastoid was normal. No labyrinth investigation was made as the patient was semi-comatose. On the following morning a drop of temperature to 102 and a severe chill, followed by profuse sweating and a rise to 104, together with the infection of a finger joint, made the diagnosis of pyæmia certain. As no other probable focus of infection than the ear could be found, an exploratory mastoid operation was undertaken, in spite of the man's grave condition, as the only possible chance. Going through the mastoid, I uncovered the dura of the sinus and cerebellum for an area of two and one-half by one and one-half inches without finding sound dura in any direction. The exposed dura was then freely opened by a crucial incision, and the sinus and cerebellum deeply incised. The sinus contained black stinking fluid and broken down thrombus, and the cerebellar tissue was softened and discolored as far as one could see. The operation was stopped, on account of the bad condition of the patient, and the wound packed loosely with iodoform gauze. When this was changed the next day, the raw surfaces did not bleed, but had the appearance of a wound on the cadaver. Death followed thirty-eight hours after operation. Postmortem enlargement of the wound showed the whole right cerebellum infected, a pocket of black fluid in its upper posterior part, and the sinus thrombotic from near the median line of the occiput to beyond the jugular bulb. The middle fossa was healthy. No fibrin or any other sign of walling off of the process was anywhere seen.

Acute middle ear processes are less apt than the chronic ones to spread to the endocranium; still, they give rise to ten to fifteen per cent. of the intracranial complications. Occasionally, when the bone between the mastoid and the brain is wanting, or is exceptionally thin, mastoid infection from acute

suppurative otitis media is rapidly followed by intracranial infection. I found such a condition in a recent operation on a nurse in the Bridgeport Hospital. An acute otitis of the right ear developed on January 12, 1908, following a severe sore throat. It presented no unusual features during the first week, except a little more fever than usual, which was attributed to the streptococcus throat and to the fact that the ear infection was due to the same germ. There were also symptoms of slight irritation of the labyrinth, deafness, dizziness and nystagmus, the latter somewhat irregular. These cleared up and the nurse returned to her duties. The discharge continued profuse and late in the fourth week the mastoid became slightly tender on pressure, though not red or swollen. There was no pain, no fever, no other symptoms. On February 9, 1908, I opened the mastoid, because of the continued slight tenderness and a little suspicion of bogginess at the tip. There was a small perforation at the tip, and the large pneumatic cells were full of pulsating pus. On sponging this out, an area of the inner bony wall of the mastoid was seen to be wanting, an anatomical peculiarity; so that a thick, fibrinous deposit was all that separated the lateral sinus from the pus in the mastoid cells. A bit of the bony wall to the middle fossa was also wanting, so that the mastoid pus was in contact also with a bit of dura. This deposit of fibrin formed an abscess wall which had so thoroughly protected the sinus dura and that of the middle fossa that they had given no symptoms except the early atypical nystagmus. Recovery was normal with normal hearing.

In any discussion of brain complications, considerable talk about operating is inevitable, for the only treatment of brain infection is surgical.

The present state of aural brain surgery is characterized by the attempt to make an exact diagnosis before operation. The field of interference has widened from simple mastoid infection, and later from suspected brain complications without evidence of mastoid infection, to include those cases of chronic middle ear suppuration in which brain complication is probable

at some future time. Some men even operate on all cases of chronic discharge which do not stop under prolonged treatment. Whether it is better by operation to end all uncertainty, and by always operating early to make exact diagnosis less necessary (thus operating sometimes when it is not necessary); or, whether it is better to wait, perhaps for weeks, in the absence of complicating symptoms, to make as exact a diagnosis as possible, and so to avoid most of the unnecessary operations, is a question not altogether settled.

There is no single symptom of an intracranial complication which alone means anything definite, for it may be produced by one of several conditions. But by a careful consideration of all the symptoms, past and present, and of all the possible theoretical causes for each symptom in turn, one may often find but one possible cause for all the symptoms. Mistakes are commonest when two or more conditions complicate each other; as meningitis and abscess for example, or multiple abscesses when only one is suspected. In some blind cases it is of course impossible for anyone to be sure; and in some cases also where there seem to be clear indications, operation or autopsy shows a wrong diagnosis. But by searching out every bit of evidence, and by thinking out all the possibilities of this kaleidoscopic picture, we are getting nearer to exact diagnosis. And the knowledge which comes from this careful study ought to help us to fewer unnecessary operations, to a better operation when we do operate, and to a smaller percentage of failures and avoidable deaths.

DISCUSSION.

DR. E. TERRY SMITH (Hartford): Mr. President and Gentlemen of the Connecticut Medical Society: I wish to thank Dr. Smith for his interesting, instructive and thorough paper.

To me, this particular subject is of unusual interest, for these cases, unless relieved by surgical interference, almost always go on to a fatal termination.

I think the title is particularly appropriate, because our diagnoses of intracranial conditions must always be attempts at exact diagnoses. Fortunately, many times, they are verified by the findings at the

operation, but occasionally we err, and this is necessarily so, for it is possible to have severe and definite symptoms of intracranial disease with simply an involvement of the ear and mastoid process.

Dr. Smith has so thoroughly gone over the exact diagnosis of labyrinthian suppuration that he has left very little to be said, excepting to emphasize that even in this condition it is possible to have an extensive labyrinthian disease with no pathognomonic symptoms.

It is well in all suspected cases of labyrinthian suppuration to have a routine to go through, and I use the one adopted by Alexander, and to be described by Dr. Davis in a paper to be read before the laryngological section of the American Medical Association next week.

First in importance is total deafness, of sudden onset.

This is a difficult symptom to diagnose, but Barany has constructed a special apparatus with which one can definitely determine total deafness on one side.

Second: Intense vertigo, of sudden onset.

This condition, which lasts on an average from two to five days, and it may be very severe, causes the patient to take hold of objects to prevent falling.

Third: Rotary nystagmus to the sound side.

This symptom is discerned by having the patient looking straight ahead and elevating his upper lid with the finger.

Fourth: The non-irritability of the labyrinth to thermal changes.

It is an established fact that the syringing of the ear with water of lower temperature than that of the body will produce, in normal people, a rotatory nystagmus to the opposite side; whereas syringing the normal ear with water at a temperature of ten or more degrees higher than that of the body, will produce a rotatory nystagmus to the same side. Therefore, when we have a patient with the above-mentioned symptoms, and who does not respond to these caloric tests, we have a most important sign of acute destruction of the labyrinth.

Fifth: Reactions by turning.

As given by Barany, normal people, after being turned ten times on the revolving chair to one side, with head bent forward ninety degrees, will show rotatory nystagmus to the opposite side, lasting on the average from eighteen to twenty-five seconds—so-called after-nystagmus.

In acute and latent cases of one-sided labyrinth destruction, we find the duration of the after-nystagmus to the diseased side diminished to eight seconds or less, approximately one-half of the duration of normal after-nystagmus.

Sixth: Galvanic reaction.

This test is made as follows: By applying the cathode to the ear directly in front of the tragus, and having the patient hold the anode in

his hand, a rotatory nystagmus will occur to the same side with a current of from two to seven milliamperes; but when the anode is applied to the ear and the cathode is in the hand, a rotatory nystagmus occurs to the opposite side with a current of similar strength.

In cases of labyrinth destruction, a nystagmus reaction requires, with the cathode to the diseased ear, a current of from ten to sixteen milliamperes, whereas from the normal side we obtain with the cathode a reaction from two to six milliamperes. These tests are quantitative, whereas the caloric is a qualitative test.

Seventh: Disturbances of equilibrium.

In acute cases of one-sided labyrinthian suppuration, we generally have marked disturbances of equilibrium, the patient tending to fall to the diseased side.

When we consider that until 1905 labyrinthian suppuration was, from a clinical standpoint, almost unknown, it is amazing how much has been done in diagnosis and treatment.

Occasionally we may have practically a destruction of the labyrinth with but few symptoms pointing to it.

Last spring, I saw a little girl who had been suffering from chronic purulent otitis media for a number of years. When I saw her, she had a sub-periosteal post-auricular abscess, and was extremely deaf in one ear. There was no nystagmus, but upon operating it was found that the semi-circular canals, the vestibule, and the cochlea were entirely destroyed.

The differential diagnosis between brain abscess and brain tumor is very difficult.

There is one symptom that I have seen present in five abscesses of the temporo-sphenoidal lobe, and that is visual aphasia—the inability to call familiar objects by their right name.

Choked disc may occur in either condition, but it is more likely to be intense in tumor of the brain, and generally occurs earlier than in abscess. Temperature and pulse are liable to be sub-normal in abscess, but may be normal or somewhat above normal, especially if the abscess is associated with meningitis.

Stupor is generally greater in advanced abscess than in tumor. In many cases the diagnosis must be in doubt; but given a case of long-standing purulent otitis media, with recently developed signs of disease of the temporal lobe, or cerebellum, and the diagnosis of abscess becomes more positive.

High leucocytosis speaks in favor of abscess, or purulent meningitis, in contrast with brain tumor.

More difficult is the determination whether purulent meningitis, or brain abscess, is present; and often the two conditions are associated in the same person.

The diagnosis is important, as less can be hoped for if purulent meningitis is present, and operation is demanded if abscess is present.

The lumbar puncture is of great value, as pus in the cerebro-spinal fluid points to purulent meningitis.

Köenig's sign is of value in indicating meningitis, but it is not pathognomonic.

Rigidity of neck is more apt to be present in meningitis.

It is important to diagnose between brain abscess and thrombosis of lateral sinus, as it is well not to open the dura unless absolutely necessary.

Sainsburn and Battle report a case in which the symptoms were severe—constant headache, drowsiness, frequent vomiting, giddiness, inequality of pupils, diplopia, well-marked double optic neuritis and pyrexia of an irregular type were present. A simple mastoidectomy was performed, and the patient completely recovered.

I have had, during the past year, a number of cases that simulated intracranial involvement. Three cases were typical pictures of sinus thrombosis; in all cases the ear drums had to be punctured. The otitis media was complicated, in one case with a lobar pneumonia, in another with a broncho-pneumonia, and in still another with an empyema. All the surgical treatment applied to the ear was a simple incision of the drum; all three cases recovered.

It is well, therefore, in all these conditions, to first clear away all the extracranial disease before performing the major cranial operations.

It is almost impossible to diagnose a severe infection of the mastoid process from an intracranial condition.

As Dr. Speller of the University of Pennsylvania has said, "Judicious delaying is one of the most difficult problems of brain surgery."

It is practically impossible to make a differential diagnosis between a localized serous meningitis and brain abscess.

A year ago I reported to this Society a case with typical symptoms of brain abscess which proved to be a serous meningitis and recovered after draining.

I wish to again thank Dr. Smith for his paper.

DR. HENRY L. SWAIN (New Haven): I have a specimen, Mr. President and gentlemen, to illustrate a couple of these conditions that Dr. Dorland Smith has so nicely brought before you. The whole aim of the paper is to emphasize the fact that certain cases of suppurative middle ear diseases come on by steady growth, without marked symptoms until suddenly we are brought face to face with changes that are serious in their significance, if not immediately fatal. And the whole hope of the surgeon is that he may discover some means by which he can detect these cases before they get too bad to be remedied.

However, there are some patients in whom we can not find the differentiating symptoms that Dr. Dorland Smith has brought out. It is only in rare instances that you can get the distinction between vestibular cases and those involving the cochlea. They have been found occasionally, but very rarely you get a pure example of either alone. I had a case a few years ago that went on to a fatal termination, as is evidenced by this specimen. And here, in the history of that case, there was no evidence of vestibular or cochlear trouble. When I saw the patient he was comatose. (These are the cases that are difficult to diagnose. When you have the chance to make a minute diagnosis of a case, that is different. But often a patient is brought into a hospital, as in this instance. The previous history is gleaned from what other people state they know of his condition prior to his insensibility, and we are called upon to decide whether a running ear is the cause of the meningitis or whatever it is that is threatened.)

In this case it was a meningitis proceeding from the internal ear, as Dr. Dorland Smith brought out in his paper. You can see here, as I pass around the specimen, the internal ear, with the semicircular canal and cochlea all plainly visible. The pus went through here into the posterior fossa of the skull and the patient had meningitis. There was no history of dizziness, as far as we obtained from the relative of this patient.

The second specimen is from a case which I followed for some months before the patient died, and you will see a very marked osteo-porosis of tubercular origin. The patient came to me while in the possession of all his senses and said for a few weeks he had an occasional feeling of unsteadiness. That was all he had to complain of except that there was an absolute nerve deafness and discharge. The case went on to fatal termination from his other tubercular troubles. I knew by probing that he had a large necrotic mass in his ear, and that it was inoperable.

Here the condition involved the whole of the petrous portion of the temporal bone, and yet nature had successfully done what she often only attempts. She had thrown about the diseased area a barrier of firm fibrous connective tissue, thickening the dura to about five times its ordinary thickness. So that although there was no bony matter over the middle ear, yet the patient had no meningeal symptoms, and died, as I said, of general tuberculosis.

In this case, if we operated we would have broken down nature's barrier and death would have resulted, because no surgical procedure could have removed that bone with success.

We welcome just such studies as Dr. Dorland Smith's paper has evidenced because they teach us to be on our guard not to let the loose ends of our practice result in fatal outcome because we do not pay enough attention to our patients. And I, myself, have surely received

additional incentive to look over some of my cases a little more carefully and see if I may not discover, through such evidence as has been brought out in the paper, the earliest appearance of involvement of the internal ear.

To show the slowness with which medical men take up ideas, Stern, who is responsible for a good deal that has been written upon this subject, brought the whole matter up quite *in extenso* in 1896, then again in 1904 or 1905. It has been since then that really any of us have paid any great amount of attention to the subject, and we have therefore been literally ten years too late in becoming interested. And I hope Dr. Smith will have the reward that is surely due him for the nice work he has himself performed.

DR. FREDERICK M. WILSON (Bridgeport): Mr. President, I am very much interested in this paper, and especially in that part of it relating to invasion of the cranial cavity by way of internal auditory meatus.

As long ago as 1889 I reported such a case to the American Otological Society, with autopsy and sections of the temporal bone. Before then a considerable number of such cases were on record, and since that time a very much larger number have been recorded. This has stimulated otologists the world over to a much closer study of labyrinth symptoms in all cases of brain infection from the ear. Although very little of this work has been published, it has been going on all over the world.

Dr. Smith has been very fortunate to be brought in contact with some of the best of the work in Vienna at Politzer's clinic, and was there long enough to observe for himself, and has applied the knowledge to some of his cases in his paper. Our mental attitude toward this mastoid work has in recent years undergone great changes, but those changes have all been in one direction, viz.: in the direction of earlier operating, more efficient operating and more extensive operating. And while there is still room for difference of opinion as to how much we shall do, as to how often we should operate, or as to how early we should operate, we can none of us go back entirely to the standards of even ten years ago.

And so with these labyrinthine symptoms, while we may differ as to how much weight should be given them, or how much may be inferred from them, we cannot go back and ignore them entirely, for in a certain limited number of cases they are the key to diagnosis. Dr. Smith has given you a concrete example of that in the case where we failed to diagnose before the operation, the cerebellar abscess.

There were three other cases in his paper (I think he read two of them), which it seems to me illustrate two very important things; one is how much can go on inside of the temporal bone without pro-

ducing obtrusive symptoms. Second, if those cases are studied with great accuracy a preventive operation can be done, and, although it is not the rule, in these three cases at least, we could be sure that we had done a preventive operation and had prevented serious results which surely would have followed.

The first was the young lady who came in merely as an office patient for headache, and, after long observation was finally operated upon and a large extradural abscess found, with granulations on the dura, that had been going on for months.

The second case was that of the nurse in the Bridgeport hospital, a case of acute otitis media with mastoid symptoms, which did not clear up. The bone was finally opened up and there was found an absence of bony wall in two places, so that the dura was unprotected.

The third case was that of the man whose symptoms were so slight while he was under observation in the hospital that we did not even confine him to his room; he went about the house doing as he would. But on operation we found an area of softened bone over the lateral sinus which certainly would have led to serious complications later on, but in no one of these cases would an operation have been justifiable from a single examination.

DR. DORLAND SMITH (Bridgeport) While the symptoms of labyrinth involvement seem numerous and rather complicated in description, they are not so much so in any single case, and one does not find anything like all of them at one visit. As Dr. Swain has said, these symptoms come out one by one in the course of a somewhat prolonged study of the case, when one is looking for these particular symptoms. By making close study of the case, waiting so far as justifiable to make an exact diagnosis, more of these symptoms and more labyrinth suppuration will be found; and more doubtful cases will be found, where, after operation, one is very glad that he has operated. And I think there will be fewer cases where operation is without relief.

The Use of the Bronchoscope and Oesophagoscope for the Location and Removal of Foreign Bodies in the Air and Food Passages.

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Up to a very few years ago, when a foreign body passed down into the trachea and became lodged in the bronchial tract, especially if it reached one of the secondary bronchi, it was considered, as usually was the case, practically impossible to reach it except by surgical means of so serious a nature that they were rarely, if ever, used. The success of simple tracheotomy, for these more or less impacted bodies which were out of the direct line of vision, was so small, owing to the lack of proper means of reaching into the unilluminated depths of the bronchi, that removal in this way was seldom attempted and usually failed. Perhaps our endeavors often lessened the chances of the final recovery of the patient. When the foreign body remained *in situ*, either with or without attempts at removal, we had the only alternative of allowing Nature to take her course, or opening the chest. To do this latter operation even the boldest operator hesitated, and I myself do not know of its ever having been attempted for this purpose except on the cadaver. Left to Nature, many of these foreign bodies, after many vicissitudes to their host, were frequently, as a result of the breaking down of lung tissue, coughed up easily and without serious choking. Quickly, on expulsion of the foreign body, the symptoms of the chronic lung or bronchial trouble from which the patients always suffer, subsided, and the patient was restored to a fair state of health. Many of you can remember such cases as having occurred in your own practice, or within your ken.

Foreign bodies in the larynx and trachea or primary bronchi presented a much more favorable prognosis for the operator

and usually were successfully removed through the natural or surgical openings.

In reporting cases it was not always stated whether the foreign body was impacted nor was its exact location always pointed out. Dr. John O. Roe, of Rochester, at one time collected 2,650 cases of all kinds, including the larynx, trachea and bronchi. Of the cases operated upon, seventy-eight per cent. recovered. Of those unoperated, many of whom so promptly choked to death that no operation could have been even thought of, much less performed, seventy-three per cent. recovered. Only five per cent. in favor of the operator. At the best, a considerable mortality.

Even in the larynx, when the foreign body is tightly impacted, or when, in children, removal is impossible owing to the inherent difficulties of using a laryngoscope under anæsthesia, we often have to resort to external incision to get rid of the foreign body. Especially is this the case among children, among whom foreign bodies are more often inspired.

The first ray of light to relieve the gloom of the old prognosis came when the O'Dwyer foreign body intubation tube was exploited. This was a large tube inserted into the larynx, possessing thin walls, and giving, therefore, larger calibre to the passage, and through it small foreign bodies could be coughed up when movable in the tracheas of young children.

To Coolidge of Boston belongs the honor of thinking to use a head mirror and long tubes through the tracheal opening to hunt for foreign bodies lying in the deeper bronchial tracts—a thing which had been possible for years, but had never been used. This method of working through an external opening in the trachea still often has to be resorted to, in spite of all the boasted success of the bronchoscope and the present technique.

A method, then, which would reach the deep-lying foreign bodies, which would lessen the mortality of all removals, and which could succeed many times without the necessity of even making a tracheotomy opening, taking place through the natural passages, is to be hailed as a true advance in the treat-

ment of these cases. Such is bronchoscopy as now understood. We are indebted to a very large degree to Dr. Gustav Killian of Freiberg, for the origin of a method which many others have helped to make very successful.

In this country no mention of the subject would be complete without speaking of the work of Chevalier Jackson of Pittsburg, of Mosher of Boston, and of Ingalls of Chicago. Dr. Jackson has worked with tubes which carry a light at the distal end, has developed and elaborated a very successful technique, and has written a very explicit book upon the whole subject of bronchoscopy, œsophagoscopy and gastroscopy.

The dangers which came as a result of allowing the foreign body to remain in the bronchial tract need hardly, on this occasion, be more than mentioned; but the chief of them, as you remember, was pneumonia, the so-called inspiration-pneumonia. Frequently the foreign body would completely plug a single bronchus, causing solidification of the area to which that bronchus was tributary; and sometimes this would lead to so large an area of disturbance and to so great a constitutional involvement, that the patient would die as a result of the wedge-shaped pneumonia thereupon developed. When this was not the case, or when the patient had lived through one or more attacks of this type of pneumonia, he was worried and afflicted by a chronic cough which would often simulate a phthisis of the tubercular type and frequently laid the groundwork for later tubercular involvement. Still, nearly seventy-three per cent. of these cases apparently got well by the final expulsion, as before stated, of the foreign body. These pneumonias will still annoy the operator who uses the bronchoscope, because the patient cannot always be brought to him before the onset of the pneumonia; and it is still a live question as to whether the use of the bronchoscope, and the removal of the foreign body thereby, does not add a new irritation to the one already existing in the tubes, and therefore increase the immediate danger of the patient. The exhibiting of an anæsthetic, such as ether, certainly increases the danger of pneumonia. The shock to the system diminishes his resistance, and

so, as just stated, it becomes a debatable point as to whether it is not safer, in the case of a well-developed pneumonia in a very sick patient, to see if you cannot wait for some resolution to have taken place before attempting the removal. If the patient is near at hand, there can be not the slightest doubt that the sooner the foreign body is removed the better.

At this point it may not be amiss to describe to those who are unfamiliar with exactly what the bronchoscope undertakes to do, what is the procedure in a case of the known existence of a foreign body which the stethoscope can readily diagnose and which the choking fits of suffocating cough would alone almost demonstrate as due to a foreign body in the trachea or larger bronchi. The presence of a movable foreign body causes an enormous amount of secretion, and often a profuse bronchorrhagia starts as one of the first symptoms of the presence of the foreign body in the bronchial tract. The purpose of the bronchoscope is, by placing the patient in the proper position, to pass it down in back of the tongue, over the epiglottis, in between the vocal cords, down the trachea and to the nearest point of contact with the foreign body. Then, having discovered its whereabouts, to capture it with suitable instruments and remove it. All sorts and kinds and conditions of foreign bodies have been known to become sucked down into the trachea. The most frequent things are those which we more often find in the mouths of children, for it is they who constitute the bulk of the patients where foreign bodies are found in the bronchial tract. They affect the placing in their mouths of beads, pits of dates, cherries and other fruit, peas and beans, seeds of fruits, feathers—all sorts and kinds of small foreign substances, to say nothing of pins and other deadly weapons. These are put into the mouth of the patient and inspired into the depths below, and usually, owing to anatomical conditions, go into the right bronchus or some of its subdivisions. Quite a fair number of them, however, go to the left and its subdivisions. It may not always appear, especially in the young child in whom the foreign body may have been in various parts of the bronchial tract during its

movable stage, whether it is still in motion or whether it is impacted. If the symptoms are not too urgent, and time and opportunity are propitious, it is very much the better plan, if possible, to take an X-ray picture and discover exactly the location and position of the foreign body. With that as a guide bronchoscopy is very much more exact than in any other way.

Having located your foreign body, I think a very good method of procedure is to give the patient, if your judgment warrants it, a full dose of morphine to quiet the cough and general irritability and to somewhat lessen the bronchial secretion. I have to suggest the use of hydrobromate of hyoscin as a further adjuvant of the morphine. Ingalls of Chicago suggested the use of atropin, and it has occurred to me that we might obtain a similar checking of secretion from the hyoscin that we would obtain from the atropin, with the added possibility of perhaps operating with the minimum amount of general anæsthesia, especially if you aid and abet the whole quieting effects by the use of cocaine locally on the parts brought into contact with the tubes. Jackson's description of the position of the patient and of the personnel and apparatus of the operating-room is so exact, that those interested in the subject are referred to his book for full particulars. It may be stated here that where one is operating on a child, he would usually have to use a general anæsthesia, unless it was a very young child, where one could, by binding the hands and feet of the patient, work successfully without it. The position, on the back, with the head hanging over so as to make a direct line of the mouth and trachea, and with the head-light illumination, are essentials in the first place. Local anæsthesia by spraying, or the application of a swab dipped in cocaine solution, always lessens the amount of anæsthesia given and enables one to do much more comfortable work than where it has to be omitted. With the patient lying upon his back, with depending head, a tube corresponding to the size of the patient and his age, such as the one herewith exhibited, which is the regular Killian make, is passed over the base

of the tongue, back of the epiglottis and between the vocal cords, down into the trachea itself, provided the foreign body is located as deep as the trachea or beyond. Into the first tube the second is passed, as hereby shown, and the second tube is pushed on as far as is needed to reach as nearly as possible to the foreign body. With the powerful illuminator, which is a necessity for this sort of work, it is perfectly possible to see down into the farthest subdivision of the bronchial tubes into which one can pass the direct tube. The foreign body, located and properly addressed, will be usually removed unless very firmly impacted. And here it is not at all unusual to have to desist on your first trial, and try again later when the effects of your first attempts shall have passed away. In the hands of such experienced operators as Dr. Killian and Dr. Jackson, they often succeed on first trial in not only locating the foreign body but in removing it.

Of course it readily occurs to you that, after one has passed the tube down into the bronchial tract, there would probably be a large amount of secretion which would be coughed into the tube, thus obscuring the vision and rendering the operator's skill immediately unavailing. Such an emergency has been met by the process of invention. The saliva pumps, as they are called, are attached to long tubes, passed down within the bronchoscope, and the abundant secretions are pumped out of the way as fast as they can form.

It is not an easy task, even as your experience grows greater, to do these operations; but one by one the little difficulties are being surmounted, and you will all see within a year or two such perfection of instrumentation and such assistance that we shall be able to succeed where we now often fail.

It now may transpire that you will have discovered, in any given case, that all your attempts are unavailing, because of your inability to reach through the larynx and trachea far enough into the lung to reach the foreign body. It is then perfectly proper for one to make a tracheotomy, perhaps at a subsequent sitting, and try through a low tracheotomy wound to get into that subdivision of the bronchial tract in which the

foreign body is located and remove it. Of course foreign bodies in the trachea, at least the more movable ones, are frequently extremely easily removed by means of the bronchoscope. Dr. Mayer of New York reports that within five minutes after he got the patient under the anæsthetic he had the foreign body removed. Certainly I have been able to remove an impacted foreign body in the upper trachea in two cases, in a not much longer time, the difficulty being more with the anæsthetic than with the removal. These bodies are shown you here. The one was a portion of the plate of a set of false teeth, which had broken off in an epileptic fit and had impacted itself in the upper part of the trachea. It had been in place so long and the swelling at the entrance of the larynx had become so great, that it was impossible to do anything more than to see that there was a foreign body there, but not to find its shape or exact size or location. The danger to the life of the patient seemed so imminent that I decided to have a tracheotomy done before undertaking the removal. Now I think, in view of added experience, that it might have been just as well done without. Yet with the tracheotomy the management of the bronchoscope was immensely simplified, and I was enabled to exercise sufficient force to dislodge the body which, although the patient was an adult, could never have occurred without a general anæsthetic. And here comes the crucial point many times. Whereas a patient may be breathing perfectly well when in possession of all his faculties, by taking care not to breathe too rapidly and coughing in such a way as not to choke himself too much, when he is put under the anæsthetic he promptly becomes cyanosed and blue, and unless you can operate very swiftly and deftly to remove the foreign body, immediate tracheotomy is necessary. Hence in this case where we were so very uncertain, I think perhaps we did well to do a tracheotomy. Also I feared the oncoming of an epileptic attack, as she often had them. The patient made an uninterrupted recovery, and was not seriously hampered or handicapped in any way by the performance of the tracheotomy. Incidentally, the danger of suffocation being so great, and the

patient being an adult, Dr. Sanford performed the tracheotomy under cocaine, and in this particular instance, with the utmost comfort. I have never seen any operation of any magnitude done with as little suffering to the patient, apparently, as this of tracheotomy under cocaine. Even the last incision of the tracheal mucous membrane and the rings of the trachea was not accompanied by any violent coughing or by the expulsion of any large amount of blood. Consequently, if one may judge anything from a single instance, it is not so serious a matter to have to do a tracheotomy in these cases in a tractable adult as I have been inclined to suppose it.

The other foreign body, also in the trachea, but perhaps a little farther down than in the first case, was in a boy ten years of age, and illustrates how a foreign body may become so securely impacted as not to be moved, even while struggling under an anæsthetic. The foreign body was discovered by the use of the ordinary laryngoscope, and having been located, the boy was put into the hospital, and chloroform was given, against which he struggled violently. The nature of the foreign body not having been ascertained, I had no knowledge of just how much obstruction was present in the tube; consequently I was prepared for the worst, and a surgeon was present, so that if, during the first giving of the anæsthetic choking took place, immediate tracheotomy could be done. However, after the first struggles, when the patient threw himself violently around, coughed, and made himself generally unpleasant, no danger resulted, and our minds were immediately at ease on that point. As soon as we had gotten the patient under the anæsthetic, I put the bronchoscope down in between the cords and immediately located the foreign body and removed it in a few seconds. These foreign bodies required some strength and manipulation to remove them, and were so firmly impacted, that under the old régime the only possible way of removing them would have been to have not only done a tracheotomy, but also to have split open the larynx and upper trachea in order to afford a sufficiently large opening through which to have removed them. The immensely less danger to the patient

which occurred in the second case by the removal as described, shows that the method of working through the bronchoscope is really remarkably superior.

The instruments for use have been immensely improved since the start. As originally designed, one had to pass down a bronchoscope of a given length, and if he found that that was not long enough, he had to take it out and pass in another. By the method now at command this is very much simplified, and one can now put down the tube which he thinks will be as large as the patient can accommodate, and then into that, if he finds he cannot reach far enough with his first tube, he passes along this groove the second tube, down into the deeper parts, with the utmost ease and with infinitely greater comfort than to have removed one and then put in the other. The hard part about inserting the bronchoscope is to get it around the epiglottis and into the trachea. Once within the trachea, the rest of the way is plain sailing as far as the mere passage of the tube is concerned.

Then to consider the other instruments involved. Besides the tubes one had to have so many lengths of forceps, so many lengths of applicators, and here again simplification has come in, and we have now forceps which are so constituted that they can be elongated, and knowing the length of tube we have inserted, the assistant can readily adjust the forceps to the required length. Instead of having to have four or five sets of forceps, one can, with two pairs of forceps, have ten different lengths, and in that way is immensely better off than with the multitude of instruments. These two instances will suffice to show you that the inventive genius of those interested is trying its best to surmount the difficulties at hand, and that we are going to be able to do a great deal more in the future than has been done in the past and with much greater ease.

But the use of the bronchoscope, and especially of the shorter tubes that are necessary to look into the larynx, should by no means be limited merely to the locating and removal of foreign bodies. It is perfectly easy to examine the larynx under ordinary cocaine anæsthesia with this shorter tube

which I here show you and which is known as the tube spatula. With this it is possible to remove new growths from the larynx and upper trachea instead of having to do them by the more circuitous route, in the adult or in the child, by the splitting of the larynx. Take for example multiple papilloma in the larynx of a young child. It is with difficulty that you make your diagnosis with the ordinary laryngoscope, owing to the fact that in children the epiglottis is very prone, and lies so far back over the larynx that it is impossible, even where the child is tractable, to see into the lower depths. With the tube spatula, under an anæsthetic, it is possible to raise the epiglottis and see both the location and size of the growth, and then with the properly adjusted forceps it is perfectly easy to remove the growth. Papilloma often return in any case, and it is such a saving in the chances of the patient for life to have removed through the tube spatula portions of the growth and to cauterize the base, as compared to having placed the patient under an anæsthetic, split the larynx open, removed the growth, and sewed up the wound again. These two methods being the only ones whereby the growth can be removed, it is easy to select the less dangerous one, and I think also that the simpler method can be fully as thorough, in many instances, as where you have actually split the larynx and have it open for easy inspection.

All that has been said of the bronchoscope is equally true of the œsophagoscope. Foreign bodies, when located in the œsophagus, have been handled pretty well by old methods. The ingenuity of man has been put to test to construct bristle probangs, flexible forceps, coin extractors, and forceps of many kinds and descriptions which, even though used in the dark and with little idea as to the exact locality of the foreign body, have been eminently successful. Now, however, it is possible to look down into the œsophagus, to inspect its entire length, even down into the stomach, and wheresoever the foreign body may be, to locate and remove it by well-regulated and well-studied effort.

Most of the foreign bodies that are impacted in the œsophagus are in the region just above or below the cricoid cartilage, down back of the larynx, just at the entrance of the real œsophagus. Here, as stated, most of the foreign bodies become impacted, and from this region, with a certain amount of manipulation, it is usually perfectly easy to remove your foreign body. If it passes farther down in the œsophagus it more often than not goes the whole length, for you will remember that although the œsophagus at its beginning back of the larynx is always a closed tube, below that region, as it passes down behind the trachea and on toward the diaphragm, it is frequently wide open, or at the most a perfectly relaxed tube; and if later any of you use an œsophagoscope you will be surprised, if you are operating upon a patient in the sitting posture, to see, as you put the tube down and get beyond the region of the cricoid, that suddenly you land in a wide open passage which leads down into the diaphragm almost without interruption. To enter the diaphragm and pass from there on into the stomach one again discovers resistance, and so the tube, which passed readily enough after having gone beyond the cricoid, is held up and must be pushed forward with great discretion. When one is once past the diaphragm, on the other hand, he again moves with the greatest ease into the stomach, and can inspect its walls, provided only that he has light enough. In the upper part of the œsophagus comparatively large foreign bodies have been impacted, and whole sets of false teeth have been located there; pits and seeds, large bits of fruit, and in children all sorts and conditions of foreign bodies such as described as being in the trachea, have even more frequently located themselves. Sometimes the foreign body is sharp and penetrating, like the open safety pin, which seems to possess the greatest horrors for the operator, even with the tubes and everything at hand to see and deal with the case. The safety pins are usually left open, and the child grabs them up and puts them into his mouth, and almost always swallows them in that condition. They could not go very far if they started point first, but usually they catch on the point just

beyond the larynx, turn over, and go on down to any particular depth that may happen to be the case. There they may get crossed in such a way that they go no farther and are lying with the point up. Such a case as this presents the utmost difficulties in removal, even with the tubes. The same may be true with bits of bone, or any other sharp-cornered foreign body, and it is quite to be expected that work through the tubes, with instruments of small caliber and of delicate construction upon such impacted masses, will not always effect removal. That we may have to resort to the older methods is not to be doubted, by which I mean the doing of an external opening in the lower part of the neck into the œsophagus and reaching down in that way after the foreign body, but this method, again, will be infinitely more successful by the aid of the artificial illumination and the present construction of tubes than has ever been the case previously, and we shall succeed undoubtedly here in cases where we have hitherto failed, even when the patient has undergone the dangers of an external opening.

When the foreign body was located below the entrance of the diaphragm and at the entrance of the stomach, the only way hitherto has been to open the stomach and go up from below. Here, also, the tubes with their illumination will come in to make the effort much more readily accomplished. For inspection of the lower part of the œsophagus and of the stomach, as well as for the treatment of diseased conditions therein found, or the removal of foreign bodies, there is no doubt that the self-illuminated tubes of Jackson are to be infinitely preferred, such a one as is hereby shown you. The fact that the light is at the end of the tube makes the illumination perfect, no matter how far the tube has reached. The reverse is the case with any other source of illumination.

The enormous advantage of the œsophagoscope for the diagnosis of diseases of the œsophagus and for the treatment of strictures is apparent to even the most casual thought on the subject, and I have no doubt that as years go by and the many observers now in the field collate their experience and learn

step by step, that we shall develop a much superior knowledge of conditions existing within the œsophagus and stomach than has hitherto been possible.

DISCUSSION.

DR. E. TERRY SMITH (Hartford): Mr. President and Members of the Society: Discussion of any subject would be superfluous after a paper by Dr. Swain, as you may be sure the last word has been said. I wish to thank Dr. Swain for his very comprehensive paper. His cases are of great interest, and show the possibilities of this new field which has been opened up.

When we consider that it is only eleven years since Dr. Killian's first paper, it is astonishing that already there have been over two hundred successful cases reported.

In Paris last summer, I saw at Professor Luc's clinic, a stricture of the œsophagus treated by direct œsophagoscopy, and as a result, the young boy will, in all probability, live to enjoy life instead of eking out a wretched existence.

A case showing the direct inspection of the larynx and trachea was sent to me last fall by Dr. William Porter, Jr. A child, two years old, was taken to Dr. Porter for an examination of the lungs, so it could be ascertained to what climate the child should be taken, as the parents had been informed it had severe bronchitis and would not be able to go through the winter in this climate.

Dr. Porter examined the chest and found, to his surprise, that it was normal, but the child acted as if it had some obstruction in the larynx; there was a brassy, laryngeal cough.

I saw the case, in consultation with Dr. Porter, and, assisted by Dr. O. C. Smith, who was prepared to do an immediate tracheotomy, I examined, under ether, the larynx and trachea by direct laryngoscopy. I found an enlarged swelling of the right arytenoid, which looked as if it might be traumatic.

Upon recovering from the anæsthetic, the child's breathing became practically normal, and, with the exception of one short relapse, it has remained so.

The explanation of the immediate improvement in breathing is uncertain, but it may have been that the manipulation, during examination, dislodged a foreign body which had become lodged in the larynx.

Just one word in regard to a great aid in doing this work, and that aid is the X-ray. I have here a picture, taken by Dr. Van Strander of Hartford, showing a foreign body swallowed by a young girl sometime over three years ago. This was spontaneously expelled about a year after swallowing, and the patient is now well.

I wish to again thank Dr. Swain for his paper.

SURGICAL PAPERS

General Pathological Conditions Occurring with Uterine Fibroid.

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It is suggested (Griffith, *N. Y. Med. Journal*, September 30, 1906) that during the periodical congestion of the organ, one or more small blood vessels may have burst, owing to the inability of their delicate walls to maintain the increased pressure brought upon them. The normal reparative processes following hæmorrhage into tissue leads to the formation of small bits of fibrous tissue. This acts as a foreign body and more fibrous tissue forms around it, and finally we have a fully developed fibroid large enough to be diagnosticated. The later decrease in size is not due to reabsorption of the mass, but to a contraction of the fibrous tissue to the smallest amount of space possible, just as any other piece of inflammatory or fibrous tissue will contract. This contraction will also produce changes as in any part not well supplied with blood.

The purpose of this paper is not to give the results of exhaustive research into the life history or habits of the fibroid tumor of the uterus, but to suggest a few of the pathological conditions occurring so frequently in connection therewith as to be more than a coincidence.

Those conditions which are directly the result of such tumors, whether from mechanical causes or degeneration, are not those which now concern us.

In the experience of every surgeon who has had considerable opportunity to observe cases of uterine fibroid, there presents early a certain number of conditions which may lead him to suspect the presence of such a growth even before local symptoms have become manifest.

Baldy (*Am. J. Obs.*, 1905) says that uterine fibroma is not a local disease, but that the process is practically a general one in

that it involves other organs, but that how many, to what extent, or how early, is not known.

A question of considerable interest is that relating to the influence which may be exerted by products of the uterine growth upon the heart and other organs through the medium of the circulation.

We know that in a normal condition of health there is a close relationship between the pelvic organs and the general physical condition, as upon the establishment of menstruation many body changes take place and the mental alterations are characteristic of the period. Corresponding retrograde changes occur at the menopause.

The uterus and appendages are brought into intimate relationship with the rest of the system through the nervous system and the blood and lymph circulation.

Through the relationship with the nervous system we see hysteria, headaches, epilepsy, asthma. Removal of a uterine fibroid has cured asthma.

In exophthalmic goitre many changes occur in the functions of the genitalia.

In osteo-malacia it has been observed that removal of the uterus and ovaries has checked the progress of the process of disease. In this case the removal of the organs is followed by a great increase in the amount of phosphorus and calcium of the bones and by a much lessened amount of nitrogen. (Wilson, *Lancet*, November 24, 1906.)

Whether these changes occur from disturbance of the nervous system or are due to the secretion of the organs we do not know.

Associated with the presence of fibroid growths of the uterus we see most frequently disturbances of the *blood, heart and kidneys*.

Thrombosis, embolism and phlebitis occur in connection with fibroid tumors more frequently than with all other pathological or inflammatory conditions combined.

Infection, usually given as the cause of phlebitis, will not explain this disproportion.

Anæmia, increase in the white blood cells and changes in the walls of the blood vessels, all contribute to bring about these conditions.

It is evident that fibroid tumors bring about such changes in the blood and circulation as to favor embolism, thrombosis and phlebitis, and this is an argument for their early removal by operation.

Anæmia. The anæmia usually thought of in connection with fibroids is the anæmia usually produced by hæmorrhage. This is grave as a complication and may produce an invalidism which operates against a favorable prognosis when such cases come perforce to operation. In a small proportion of cases this hæmorrhage may be of itself enough to be the cause of death.

Aside from the anæmia or exsanguination produced by hæmorrhage or menorrhagia there is a pronounced and frequently observed anæmia occurring early or without uterine flowing.

In one case, a maiden lady of fifty had been treated for a year with tonics, advice to travel, residence at the seashore, etc. The hæmoglobin reading (Dare) was forty-eight. Menstruation continued, but was scanty. Upon examination a fibroid was discovered. After hysterectomy the blood rapidly came up to normal without the use of iron or other hæmatics.

Another patient was treated for anæmia with little success. Result of local examination was negative. One year later, upon making a second examination, a small fibroid was found in the fundus. This had undoubtedly been present in the first place, but was too small to be readily detected. After myomectomy the anæmia cleared up, again without the aid of drugs.

We may conclude, therefore, that myoma, and carcinoma as well, have a decided influence on the blood, inducing a great reduction in the hæmoglobin and a high leucocytosis. These conditions tend to correct themselves after removal of the growth.

In a case of myoma, where the findings of blood examinations show a tendency toward improvement, a waiting policy may be allowable; where the findings grow worse, the operation should not be delayed.

In case of low hæmoglobin index and small number of red cells, the possibility of degeneration of the heart muscle should be borne in mind.

A certain number of cases will present evidence of functional or organic disease of the heart.

Murmurs at the apex may be due to anæmia. Cardiac hypertrophy may occur even when the tumor is of small size.

The careful examination of the heart in cases of uterine fibroids is to be emphasized. If any abnormal conditions are present, the indications for removal of the growth are more pronounced, and these conditions, unless unusually severe, should not be looked upon as contra-indications to operation. In operating, these conditions may well influence the route of approach, since the vaginal route, where it is possible, makes less demand on the heart.

Kidneys. Renal disturbances are common in association with fibroids. There may be a diminished amount of urine. Albumen may vary from a trace to a large amount. Casts may be present and œdema of the extremities may occur.

These conditions may occur even when there is no history of previous organic renal disease.

Many, if not most, fibroid cases that die after operation succumb from kidney complication. Again, others recover, but with persistent albuminuria.

Pressure from large tumors, causing dilatation of ureters, may result in degeneration or destruction of the kidney, the result being the same as that produced by the circulatory changes.

Bladder. Disturbances of the bladder, so commonly associated with myoma, are usually due to local causes, pressure or infection.

The question of operation in fibroids may be influenced or decided by outside conditions. Even the presence of the

growth may be unsuspected or obscured by these secondary conditions, which may be severe enough of themselves to demand operation.

DISCUSSION.

DR. WILLIAM H. CARMALT (New Haven): Mr. President and Gentlemen: There is one contingency, in these tumors of the uterus, which has not been referred to in the paper, but which, though seldom, we must recognize. These so-called fibroids are almost universally spoken of as benign, of absolutely local origin and development, only dangerous by reason of their encroachment by pressure on neighboring organs, or from their effect on the uterus itself by inducing hæmorrhages, etc. A case came to my care, a few years ago, in which the subsequent course was so unexpected that it should be recorded. I was requested by Dr. J. P. C. Foster of this city to see with him an unmarried woman, of some thirty years of age, whose father had died of cancer of the prostate, who had a tumor involving the whole uterus. It had been discovered almost accidentally, when it had reached a considerable size; i. e., about as large as a pregnant uterus of four months. It had given rise to no symptoms whatever, but having, in the course of a couple of weeks' observation, increased markedly in size, its removal was advised and readily consented to. The operation presented nothing unusual. The growth was found to involve the whole uterus and a complete panhysterectomy was carried out. The recovery was rapid and uneventful. Some months afterwards she called our attention to another tumor, in the left umbilical region, about over the left kidney, discovered by herself almost accidentally also by palpation. There were no symptoms associated with it. She decided not to have anything done for this, unless symptoms necessitated relief, and it was simply watched. She soon after began to have severe and persistent headache. This was soon followed by double vision; then vomiting and failure of vision. Examination of the eye ground showed choked disk, and she died, in less than a year after the discovery of the uterine tumor, from a tumor in the brain. No examination of the abdominal or of the cerebral tumors was made, but the examination of the tumor of the uterus by Dr. Bartlett, made at the time of its removal and subsequently, after the appearance of the later tumors in distant organs, showed it to be a pure fibro-myoma; i. e., the typical benign tumor of the uterus, usually, though incorrectly, called fibroid.

Judging from their clinical course, the later tumors were undoubtedly some variety of sarcoma. They could not be regarded as secondary or metastatic, but they show that in certain persons there may be a proneness or tendency to neoplastic formations of different

characters, which we can no more account for than we can solve the problem of the original growth. We do not consider a sarcoma as in any particular a derivation of or a transition from a myoma, as is the case from a fibroma from which it may generalize. Nor was this a generalization. It was an inherent tendency to aberrant growths of different types, and, as such, it must be recognized that a woman with a myoma of the uterus *may* subsequently develop sarcomata in distant organs.

Bier's Treatment by Hyperaemia.

ALFRED M. ROWLEY, M.D., HARTFORD.

The medical profession has often been justly criticised for too quickly taking up with and using new agents in the treatment of disease. Remedies that have been presented and lauded for their specific value, but, when sufficiently tried, prove to have but little worth, are soon discarded. Such agents are generally introduced by one who is held in high esteem, and is deserving of confidence, but whose experiments have been incomplete, or whose deductions have been faulty. Such agents, to be so eagerly received, must have a therapeutic claim to produce such a physiological condition as coincides with the opinion of the profession as to what is desired when they are administered, and one that acts contrary to their opinion is always slow of recognition. Such a one I wish to call your attention to, namely, passive congestion, for it is an application of a therapeutic principle that tends to discredit the beliefs of the surgeons who have been educated in the anti-phlogistic school.

The honor of presenting it belongs to August Bier, who has been singularly honored, and has had the highest rewards bestowed upon him for his scientific work and experimental research; beginning as he did as an assistant to Professor v. Esmarch in the Surgical Clinic at Kiel, then becoming the chief at the Greifswald Clinic, later called to Bonn, and finally to take the chair of surgery at the University of Berlin. Professor Bier published his first article upon passive congestion in 1892 (1), explained the theory of its application and of its use, and since that time has repeatedly advocated it. But the support of the surgeons has been slow and reluctant, and especially so in this country; and while the journals of to-day teem with articles advocating his treatment, scarce mention of

its use can be found in the medical periodicals of over six years ago, published on this side of the Atlantic.

For years the signs of inflammation, pain, heat, redness and swelling have been looked upon as pathological symptoms, and as such to be combated, and the nomenclature of medical literature of all ages is filled with the description of symptoms of diseases called by some name ending in "itis"; and while it will be impossible to correct the naming of such, yet we shall be forced to change our views in regard to the effect of inflammation, and consider it a method used in accordance with the laws of nature to combat infections and repair injury.

It is well known that active hyperæmia produced by hot air was first brought out by Professor Bier and used by him, and while he obtained results from it, in producing absorption of œdema and bloody effusions, in the treatment of neuralgias and neuritis to relieve the pain, also in some joint affections, its beneficial effect was singularly wanting when applied to tuberculous lesions of the joints.

Bier's attention was first called to the use of passive congestion by his deductions from the autopsy findings of Professor v. Rokitansky (2), who observed that patients who suffered from pulmonic congestion caused by a heart lesion, seldom if ever had phthisis, while in that rare condition of pulmonic stenosis they nearly all succumbed to the disease. Reasoning from this that the blood had the property of destroying the tubercle bacilli, and that the micro-organisms were less active when there was a slowly moving venous current, he applied bandages to the proximal side of joints affected with tuberculosis, sufficiently tight to produce a slight venous congestion, and although Bier has elaborated his method of producing the hyperæmia, this still remains the simplest and most efficient means when applicable.

Bier discovered, by experimentation upon himself, assistants and patients, that the constriction bandage, which consists either of a Martin or Esmarch, when applied to a healthy extremity with light pressure, raised the heat (3) of the part distal to the constriction; and when applied to a limb where

infection was present, the rise was more marked, even from one to three degrees C. Again, it was demonstrated, that under slight constriction, the local pain and tenderness around the diseased area was lessened. On the contrary, the opposite effects were observed when the bandage was applied with too great tension. The extremity was rendered cold, pain and throbbing were present, slight reddish purpuric spots soon appeared, and the bandage could be worn but a short time. Thus it appears that the dosage of this form of constriction is very essential, and one must have a guide to go by when applying it. There is none better than that given by the patient as to whether it causes or aggravates pain, and we can use this as an axiom.

Passive congestion, produced for therapeutic purposes, should never cause pain. If it does, either the technique is faulty or its application harmful.

Obtaining such brilliant results, and being so impressed with its use in tuberculous cases, he enlarged the field of its usefulness by applying it in the presence of other infections, also devising other means of producing hyperæmia when the bandage or rubber tubing was not applicable, as upon the trunk, mammæ, etc. Thus, by bringing again into use the cupping-glass and jars, to-day the methods are so perfected that, with the exception of the hip, most joints ordinarily attacked by infections, and nearly all soft parts, can be placed under treatment. Like many other treatments which had been tried, before the profession was as well versed in the pathology of lesions, and finally given up as of but little value, so was hyperæmia, and Professor Bier gives due credit to Ambrose Paré (4), who first conceived the idea of sending, by means of bandaging, more blood to the point of fracture when there was insufficient callous. This is in order that the part might have more nutrition. No further mention in literature is made of the method until Nicolodoni (5) described, in 1875, v. Dümreicher's method, which he advocated, as he thought, for the first time, but its principle and aim was almost identical with that of Paré's. Bruns (6), and Thomas (7), an English

writer, again mentioned it in 1886, but with the same idea of helping bone to unite, and it was left to Bier to explain more fully the principle for which it was used, and develop it until it became so well recognized by the profession that he was given the Kussmaul prize in August, 1906.

As is well known, he first used hyperæmia upon tubercular joints, applying the constriction proximally, close to the affected joint, leaving the bandage on for hours and days, and then only changed it to relieve the constricted part from pressure and again reapplied it. Under this form of treatment, Bier obtained various results, some excellent; but he noticed cold abscesses often developed and that fistulous tracts, when present, were prone to form large granulating wounds. He then changed his treatment, believing that chronic œdema, resulting from such prolonged damming, was harmful; and he gradually reduced the length of time of application, until now he applies the bandage for one hour each day, the constriction being as tight as the patient can bear without producing pain. Cold abscesses, when present, if the case can be carefully watched, are opened and treated with the cupping-glass in conjunction with the bandage, or with the large jars in which the whole joint is encased, or the older method of aspiration and injection of anti-tubercular solutions of iodoform or formalin and glycerin are used. The guide to the amount of air to be removed by the pump or rubber bulb, when the cups are used, is the same as with the bandage, namely, the sensation produced upon the patient as to whether it causes pain or not; and the guide to the frequency of the treatment, and length of time of each, should be as to whether the resulting œdema has been picked up during the hours of rest. Many cases can stand and be more benefited with more frequent applications, as often as once in twelve hours. The cups, when used, are applied continuously for a period of five minutes, when they are removed, left off for three minutes, and this repeated intermittently for three-quarters of an hour for every twelve or twenty-four hours. Massage and elevation, after the treatment, help to pick up the œdema in those cases that absorb it slowly.

Bier does not rely as much upon fixation splints as the orthopedist who treats the lesions in the old way, but soon allows the joints to functionate, only moving to the point of producing pain; and does not permit the joint, as in the knee or ankle, to bear the body weight; and he impresses upon the patients that severe trauma would greatly injure the joint, retard the cure, and light up or aggravate any existing disease.

This treatment of Professor Bier's, in such a distressing and almost hopeless condition, if amputation is ruled out, is of necessity very conservative, and to get results it must be continued for a long length of time, and persisted in even after apparent recovery. They must be carefully watched during its administration, but when a result is once obtained, the mutilating operations have been avoided, and the usefulness of the part generally preserved.

The results of this treatment as used by Bier (8) from April, 1903, to August, 1904, were as follows: In tuberculosis of the hand, healing ensued in eighty-eight per cent. of seventeen cases, in the elbow seventy-two and seven-tenths per cent. of eleven cases, in the foot sixty-one and five-tenths per cent. of thirteen cases, many of these being complicated with abscesses and fistulæ. Surely these are the most promising statistics for the treatment of these different lesions. With the development of the technique by producing hyperæmia with the cups, other tuberculous affections of the skin, tendon sheaths, bursæ and testicles have been treated with success. The contra-indication for its use is when there is a secondary pulmonic infection present which is advancing, when there are signs of beginning amyloid changes, and when the local tubercular lesion is so far advanced that it is only amenable to other more radical methods.

There are no better results with hyperæmia than those obtained by its use in severe gonorrhœal joints, that severe infection that baffles the surgeon and which, with all his efforts called into play, is very often followed with such distressing results. How many have wished, after trying hot and cold applications, rubefacients, hot air, plaster casts, and all other means at their disposal, without any apparent result, they could

find some one thing that would relieve the pain and distress of their unfortunate patient? And it is safe to say that Bier's treatment, when carefully and cautiously used, is the best means at our disposal, and in this connection I wish to briefly report the following case.

Case 1—Male, twenty-two, residence Hartford, first seen September 9, 1907, contracted gonorrhœa three weeks previously, temperature 101.2° , pulse 104. Physical examination, heart and lungs normal, also abdominal organs. Examination of the penis showed a thin whitish discharge. Urination frequent and accompanied with some vesical tenesmus. The right knee and ankle were swollen, also the left elbow; suffered much pain in the joints during the night. They were painful to pressure, also to motion. The joints of the right hand were slightly affected. An Esmarch bandage was applied, over gauze, around the middle third of the right thigh, sufficiently tight to cause a slight bluish redness down the entire leg. The left elbow was poulticed with flaxseed. The bandage remained on the thigh for five and one-half hours, when, upon examination, slight œdema was found; but the tenderness was markedly decreased both at knee and ankle, and the pain gone to such an extent that he voluntarily moved both joints to a slight degree. The elbow was still some painful, and the least attempt at motion aggravated it. The right leg was then elevated and rubbed to favor absorption of the œdema, and he was instructed to again apply, in four hours, the constriction bandage, the guide to the tightness being so as not to cause pain. One was also applied to the left arm, this to remain on for ten hours and then massaged. September 10 both extremities were much improved as regards tenderness, pain and mobility, but the wrist and metacarpo phalangeal joints of the right hand were beginning to give him some more discomfort, and the same treatment, with elastic bandage, was employed here. The results of this, carried out in conjunction with treatment upon the urethra to remove the source of infection, were as follows: The joints of the right hand gave no pain on motion at the end of the fifth day, the left elbow in eight, the knee in twelve, and

the ankle could bear the body weight at the fourteenth day. These results were most striking, and especially marked was the almost instant relief of pain after the bandage was properly applied, and in consequence of the ability to move the joints, the functions were preserved. Many surgeons have reported brilliant results in the treatment of joints affected with gonorrhœa, notably Willy Meyer (9), who is such an enthusiastic advocate of the treatment. In other forms of acute articular rheumatism of non-specific origin, the results are almost as remarkable, as the following case will illustrate:

Case 2—Mrs. K., age fifty-four, for three weeks has been confined to bed with rheumatism, involving one joint after another until nearly all joints of the extremities were affected. During this time has taken salicylates to tolerance, also alkalis. She was first seen March 25, 1908. During the preceding night she suffered great pain in the left knee. The other joints have much improved, giving but little trouble except for stiffness and pain upon motion. No morphine was administered because of the idiosyncrasy of the patient to it. The Esmarch was lightly applied around the thigh, which gave perfect relief in twenty minutes. She was directed to allow it to remain ten hours, when hot applications were to be applied to the knee. The following night she had but little pain, and when seen upon the morning of the 29th, she had again applied the bandage herself, and eagerly showed with what ease she could move the joint. One week later she enjoyed the freedom of walking about her room, and was using the bandage to hasten the cure of her hands.

The next case which I wish to report is especially interesting to me, as the writer had the misfortune to be the patient.

Case 3—A. M. R., while doing a radical operation upon a chronic empyema the morning of May 7, 1907, received several small wounds caused by the ends of the ribs as they were resected. Following the operation, the hands were washed in bichloride solution. No further attention was paid to them until the evening of the same day, when two small punctured wounds of the left index finger and a small abrasion of the

second finger of the right hand became sore and commenced to throb. The wounds were cauterized before retiring, and a rubber band was placed around the base of the index finger. The second finger was left free. The bands at his disposal were either too loose to produce any result, or when doubled, so tight as to cause pain. The following morning at 4 A. M., he experienced a chill, and at 8 A. M. the thermometer registered 104.2° F. The local appearance of the left index finger was that of a very acute inflammation. The finger was swollen to the point of constriction, red and œdematous. The pain was but slight. The two wounds were discharging a thin serum. There was no line of redness or swelling upon the hand or forearm. The appearance of the finger of the right hand, however, gave occasion for some alarm. The heat and swelling was not confined but extended to the hand, and the lymphatics were mapped out by a red line, extending to the axilla. The glands at the elbow and axilla were swollen and painful, and there was considerable pain in the finger and hand. Dr. E. J. McKnight was called in attendance. He treated the wounds locally with iodine and wet ichthyol dressing, applying Bier treatment to the right arm. The following day the œdema and swelling of the left index finger had practically subsided, and the wounds healed very kindly in a few days, leaving no scar. The infectious process on the other finger of the right hand looked somewhat more localized, but for fear of waiting too long, remembering that incisions, in beginning infections, are generally twenty-four hours too late, one was made from the metacarpo phalangeal joint to and over the first phalangeal joint, also one at the same time between the second and third fingers. Bier treatment was continued with, and, at the end of three weeks, the wound was healed without any loss of function.

These streptococcic infections, caused by the same agent, at the same time, upon almost identical parts of either hand, with the double vaccination on the left finger, both becoming painful at the same time, the one treated with early constriction healing in four days, and the other in three weeks with the resulting

scars from incision, would seem sufficient to prove the prophylactic value of passive hyperæmia; and, to the writer, it has to such an extent, that almost the first treatment that is thought of when the suspicious wound is received, is that of hyperæmia; and surely Willy Meyer is right, when he advises all surgeons to so treat, together with antiseptic solutions, all wounds caused by an infected agent.

Of almost equal importance is its use in infections existing for several hours or days. The extra amount of blood thrown to the part helps to nourish it, tends to prevent sloughing, and aids in repairing the wound. Sufficient drainage can be obtained through small incisions, and thus the tissues saved from so great mutilation with the scalpel. Too great reliance, however, should not be placed upon it in deep seated streptococcic infections, but its use should be combined with free incisions.

There has been much controversy as to what property of the blood its antibactericidal properties depend upon. Buchner (10) thought it due to the local hyperleucocytosis. Hollister (11) states that, by experimentation, he has found a hyperopsonization in the serum exuding after applying the cups, as compared with that of the general circulation. Stahr (12) noticed that, in ten cases examined by him, the number of erythrocytes and the hæmoglobin content remain unchanged. The leucocytes showed a marked increase up to the third or fourth day of the treatment. This local increase affected the lymphocytes while the neutrophiles showed a decrease.

While these experiments are instructive, it is doubtful whether the therapeutic value of Bier's treatment depends upon any one factor alone, but rather that they probably act co-jointly; and until this has been accurately demonstrated, we must agree with Bier that it is the blood that does the work, or to quote from him: "The retarding of the circulation renders harmless the bacteria and other toxins."

The general contra-indications for the employment of Bier's treatment may be stated in those cases in which there is a local chronic œdema. In atheromatous cases it should be used with

caution, and in the diabetic, if used at all, the application must be brief and light, and the absorption of the resulting cedema hastened by massage or elevation.

The length of time allotted to this paper prevents the writer from reporting other cases, or referring to many interesting ones reported by surgeons in this and other countries. Sufficient it is to say that the number of diseases in which it is being successfully used is increasing, and that the field of its usefulness is constantly being enlarged, and although no panacea or cure-all, it is recognized by leading men as of great value when scientifically employed.

BIBLIOGRAPHY.

1. *Verhandl. der deutschen Gesellsch. für Chirurgie.* 1892, Vol. i, p. 21.
2. Farre and Travers. 1815.
3. Translation by Gustavus Blech of "Hyperæmia as a Therapeutic Agent," by August Bier.
4. "Œuvres Complètes," d'Ambroise Paré, Edition of Malgaigne, Vols. i, lxiii, chapter 30.
5. Nicoladoni. "v. Dumreicher's Methode Zur Behandlung drohender Pseuderthrosen," *Wiener Med. W.* 1875, Nos. 5, 6, 7.
6. Bruns. "Die Lehre von den Kuschenbrüchen, Deutsche Chirurgie," Brochure 27, 1886, p. 507.
7. Thomas. "Contributions to Surgery and Medicine," part xvi.
8. Bier's book upon Hyperæmia, 5th edition.
9. One of nine cases treated by passive hyperæmia reported April 3, 1908, by Willy Meyer. Surgical Section, New York Academy of Medicine.
10. Buchner. "Ueber die natürlichen Hilfskräfte des Organismus gegenüber den Krankheitserregern," *Münchener Med. W.* 1894, No. 30.
11. Hollister. Discussion of Willy Meyer's paper upon Hyperæmia read at A. M. A., 58th session.
12. E. Stahr in *Wiener Klinische Wochenschrift*, No. 9, 1906.

DISCUSSION.

DR. PHILIP D. BUNCE (Hartford): It is with some diffidence that I stand here to discuss this paper, especially as we are yet to hear Dr. Bacon, who comes from the fountain head of the modern method of applying this treatment, and I hope that when Dr. Bacon comes, he will be listened to very intently.

About a year and a half ago I had occasion to read a paper on this subject, before the Hartford Medical Association, and I was very harshly criticized for the method of treatment. I believe the harshness of the criticism was mainly due to lack of familiarity with the literature of the subject. At any rate, after the meeting, one of the members came to me and condoled with me over the hard position I had to exploit the Bier method of treatment.

I reported a case last fall, a young man eighteen years old, with tuberculosis of the tarsus and carpus. He was treated by the Bier method of constriction, for one or two months, with slight improvement. He was dissatisfied with the speed of the treatment and disappeared. He was operated upon and was much pleased because he was cured so quickly. But now nine months have passed and he has recurrences in a much aggravated form.

In regard to relief of pain by this method. This method does not always relieve pain. I instance one case of tuberculosis of the knee, with very severe pain, controlled by morphine and hot applications. Bier's treatment was used, but the Bier treatment seemed to have no influence over the amount of pain.

This, however, is a rather unusual instance, as the Bier treatment almost always controls the pain to a more or less extent. In an instance of gonorrhœal knee, which I saw with Dr. Rose of Hartford and your president, a young man of twenty-five had a gonorrhœal knee, with pain, swelling and temperature. The Bier treatment was used at the end of two months from the onset of the disease. The symptoms subsided, under the use of the Bier treatment, together with immobilization. The man has recovered all but about fifteen degrees in the use of his joint.

One case under observation now, of a young man of eighteen, has quite extensive involvement of the metatarsus with tuberculosis. It seemed a question of amputation almost surely. Under the Bier treatment, by use of cups and at the same time opening the small collections of pus, the inflammation has subsided considerably. He is yet under treatment and is doing fairly well.

One of the great troubles with the Bier treatment is, that in chronic bone cases the patients are apt to get dissatisfied with the treatment and stop it for surgical treatment.

DR. LEONARD W. BACON (New Haven): Gentlemen, it is rather a shabby trick, on the part of my friend and predecessor here, Dr. Bunce, to announce that I have come to tell you all there is to know about the Bier treatment. I do not make any such profession at all. I did have the pleasure, last year, of a brief visit to Professor Bier's clinic at Bonn, and was impressed with what I saw there; but my knowledge

of the treatment is chiefly acquired by reading on the subject and by what practical applications I have been able to make of the treatment in my own practice.

With regard to the paper under discussion, there were one or two points which I should like to call attention to. One of these is the question whether or not it is necessary to consider pain as an essential attribute of acute inflammation.

The old Hippocratic tetrad of symptoms, pain, heat, redness and swelling, we are all familiar with. Through the Bier treatment we obtain the redness, the swelling and the heat, and apparently we are reproducing, in all its essential aspects, an artificial inflammation, and, with the inflammation, those curative functions which a genuine inflammation brings with it. It is very fortunate that in this artificial inflammation we can generally avoid pain as an attending symptom.

The writer of the paper has spoken of the raising of the local heat in the passively congested part, as compared with that of the symmetrically corresponding part of the body. This rise of local heat does not, however, occur in all cases in readily demonstrable degree; and, in estimating it, it is necessary to guard against the loss of heat by radiation, in the part that is passively congested, and to afford it protection from chilling at least equal to that provided for the symmetrically corresponding part of the body with which the comparison of local temperature is made. If this is not done, you can hardly estimate the heat factor correctly.

One of the chief and most important things to guard against, in the application of the constricting bandage, is a *diminution* of the local temperature in the constricted part. This is not the most sensitive indication of the proper degree of constriction. The most sensitive indication is the report of the patient as to the feeling of pain. But the surgeon naturally likes much better to rely upon objective than upon subjective symptoms, and among the objective symptoms that can guide him, the local heat in the constricted part is perhaps the most important of all. When there is proper protection against loss by radiation, the loss of heat in the congested part is pretty distinct evidence that the constriction is too tight.

The three cardinal guides to the proper degree of congestion are, first, the relief of pain, or at least the absence of any more than a brief and temporary increase in the pain; in the second place, the increase in local heat, or at least the absence of any diminution of the local heat of the congested part, when properly protected from loss of heat by radiation; and in the third place, the absence of the vermilion petechiæ, which will appear even on a healthy limb when the constriction is too tight.

The difference between an adequate and proper degree of constriction and an excessive degree of constriction, is a very important one therapeutically.

apeutically, and, where the constriction is too tight, beside the pain and the loss of heat in the part, there will be the appearance of little vermilion red blotches on the skin. Now, with the most careful application of the constricting bandage, if the constriction is adequate for its purpose, there may be a few of these spots, but the appearance of any considerable number of them is an indication that you are upon the border line between what is useful and what is harmful.

Both the writer of the paper and also Professor Bier, himself, except the hip joint, as being a part of the body to which passive hyperæmia has not been successfully applied. I have had two cases, in which, with special apparatus I have constructed, I have been able to obtain successful hyperæmia of the hip joint. The apparatus has to be specially constructed for each patient, and this demands considerable time and labor; but it has given me effective hyperæmia of the hip, and it allows the application of the treatment without the immobilization of the joint.

I have not time to comment further on the paper, but I want to add just one word more. The cases in which this treatment is applicable should, I think, be considered in two categories: first, those cases in which we are dealing chiefly with a condition of hyponutrition; that is, where the local nutrition of the part is poor; and secondly, those in which local infection of the part is the more considerable element.

The way of stimulating the nutrition in atrophic parts is by a constriction so slight that it shall raise the intravascular pressure without causing œdema or exudation. The way of combating a local infection is by a little more tense constriction, causing an acute œdema of the infected part.

DR. ERNST H. ARNOLD (New Haven): Since 1906, when I saw the Bier treatment first and watched the results in bone lesions, I have been using it quite extensively, in all tubercular lesions, practically without exception.

I want to emphasize a point in the prognosis. I don't think we should approach the result, in chronic joint or bone disease, tubercular or otherwise, as influenced by Bier's treatment, from the standpoint of time. I think that our experience leads us to believe that we do not reduce the time necessary for a cure markedly in these cases. It is very difficult to tell at the start how long these chronic joint lesions will last. I, in my own experience, have not found Bier's treatment to shorten the time of recovery in any of the instances, as far as I could judge from the severity of the case when undertaken. With proper treatment by rest, we have recovery from joint tubercular lesions in three or four months quite frequently; others, oftentimes, drag out over years, with the same kind of treatment, reflecting on the condition of the patient in response to disease only and not on the treatment.

The Bier treatment, I think, should be tried a year, at least, in joint or bone lesions of a chronic character, before you can say whether it has influence for the better or not.

One thing, however, that is very apparent to me, is that it does most good in cases that have not been favorably influenced by any other kind of treatment. It has been in my desperate cases, those that did not respond favorably to any kind of treatment that I could devise, that I have had my best results.

I have used it in two or three children, where I had not only one lesion to deal with, but two or three. All the cases I have in mind now are dispensary cases, that are very apt to drift away from treatment after the first lesion has been influenced favorably. The parents come to the conclusion that the child is well, never appear again, and the child then turns up with the second lesion, and is of course in a much worse condition. I recall where a third lesion had appeared on such neglect and where Bier's treatment had immediate result.

I think the immediate result is usually shown in the letting up of pain. It disappears often within an hour, within a day certainly, and is a good sign of the joint's being influenced favorably, in my opinion.

Another case was that of an adult, with tubercular disease of the knee, who had a tubercular history; had tubercular glands, one side of the lung was said by the attending physician to be tubercular, and who would be a bad subject for any kind of treatment in tubercular joint lesion. He had been treated by the first physician for three and a half years, with poor result. I commenced treatment in much the same line he had and saw quite a fair success. When I returned from Europe I put him under Bier's treatment and he then made a recovery that has been very rapid and quite complete, for he is now without symptoms for nearly a year, which in such a case as his would show very well for the treatment.

I also want to say a word about the treatment in gonorrhœa urethritis, for I think there the results are good. The cases I have had a chance to treat never failed to give most beneficial results and give them quickly.

A word as to what is called rheumatism, and especially what is called inflammatory rheumatism. I think if inflammatory rheumatism were investigated very closely, no doubt fifty per cent. of the cases would prove to be nothing but infections of one sort or another of the joints. If they were treated with Bier's treatment I think a good many of them would do well.

DR. WILLIAM H. CARMALT (New Haven): I have had but little experience with the Bier treatment in chronic tubercular lesions, to which Dr. Arnold's remarks principally refer, but, about a year and a half ago, a case of acute septic infection came under my care, at the New Haven Hospital, in which the value of the treatment was so

striking that I cannot refrain from reporting it. An old tramp had had both feet frozen to the ankles, as the result of an all night's exposure while drunk in freezing weather, and was taken to the poor-house. He became rapidly septic and after about four days was sent to the hospital, where I first saw him. When admitted both feet were gangrenous nearly to the ankles and emitted a most foul odor, the legs were œdematous to the knees, no line of demarcation was evident and the gangrene was spreading. He was delirious, almost comatose, from general septic absorption; he could give but unintelligent responses to questions, only capable of being aroused by vigorous shaking, etc. Pulse almost imperceptible, running to 130 and over; temperature $104^{\circ}+$; tongue, brown and dry. It didn't seem possible that anything could save him—he was apparently dying. The Bier treatment escaped my mind at the first visit and the usual antiseptic treatment, of wet bichloride of mercury compresses, was applied locally and general stimulation administered. At the end of twenty-four hours, the patient being decidedly worse, I bethought myself of this treatment and had an elastic bandage applied around each thigh, at about the middle; keeping up, however, the antiseptic treatment locally, on account of the stench, which was otherwise intolerable. In the next twenty-four hours there was a most striking change for the better in his condition. He answered questions coherently; he took nourishment without urging; his temperature had fallen to about 100° ; the acute red œdema had disappeared. In the following twenty-four hours a line of demarcation became evident, and, to make the story short, he was on the way to recovery, which was accomplished in due course, after the amputation of both feet above the ankles.

DR. JOSEPH M. FLINT (New Haven): I did not have, unfortunately, the pleasure of hearing all of Dr. Rowley's paper on the Bier treatment, but I would like to add a word concerning my recent experience with the method, in the New Haven Hospital, not so much in chronic bone conditions as in acute infections.

After I came on service, the first case in which we had an opportunity to apply the method was one of acute gonorrhœal arthritis of the knee, and you all know the frequent unsatisfactory results due to a partial ankylosis in these cases. The patient, however, was a difficult case to handle, from the fact that he had a very irritable skin, with marked urticaria; so that the normal application of the bandage, from twenty to twenty-three hours a day, was limited to something like six or eight. After washing out the joint with the salt solution, the bandage was applied regularly and within three weeks he left the hospital with a perfectly mobile joint.

The second case is one of acute epididymitis, which is still in the hospital. The treatment of these cases is very unsatisfactory with

ordinary methods. But within twenty-four hours after the application of the constricting bandage, his temperature dropped to normal and his epididymus now, six or seven days after treatment, shows the typical picture of the induration seen in the old chronic cases.

The last case is one of erysipelas of the face. Certainly, no successful method of treatment for the cases has been devised, other than by injection or the usual compresses. In this instance, the case came to us rather late; the temperature was over 105. We applied the constricting bandage around the neck. Within twenty-four hours his temperature had dropped to 102, albumen in the urine was markedly decreased in quantity and the patient has now completely recovered.

The effect of the Bier bandage in these acute cases was partially foreshadowed by the experiments made in Marchand's laboratory, by a group of his pupils, who showed that many times the fatal dose of a poison could be injected into an extremity distal to a constricting bandage. This result was due to a delayed absorption of the poison, which allowed the animal to neutralize an otherwise lethal dose. Aside from the fact that the passive hyperæmia seems to increase the bactericidal power of the body juices in the hyperæmic area, these experiments seem to explain one of the reasons why the Bier treatment is so valuable in acute inflammations, where the toxæmia is so great that it is apt to overwhelm the patient. The damming back of the toxic products permits their absorption in such quantities that they may be neutralized, as well as exposing the infective agents to the increased bactericidal power of the body juices.

The development of the Bier treatment is of great interest. Bier conceived the idea from the well-known fact that lungs showing a condition of chronic passive congestion rarely give evidence of any active tubercular process. Bier was a pupil of Esmarch, the inventor of the Esmarch bandage; and when he proposed to use passive hyperæmia therapeutically, his experience with the Esmarch bandage at once suggested this as a practical method of inducing a venous stasis.

DR. ALFRED M. ROWLEY (Hartford): In applying the treatment in gonorrhœa, it has been my experience, that in those severe joint cases the beneficial effect is more marked than it is in those in which the infection is but slight.

As regards pain. We used to think that pain in the presence of inflammation was caused by the extra amount of serum exuded, thus causing pressure upon the terminal filaments of the nerves; now we know it is produced by toxin irritation, and the lessening of pain by Bier treatment is occasioned by the slight œdema caused, very much in the same way as anæsthesia may be produced by subcutaneous injection of sterile water. I have had but little experience with the treatment in tubercular joints. In two cases of osteomyelitis of the thigh I had very good success.

Bier's treatment not only prevents rapid absorption of the toxin, but it holds the toxin at the point of original infection, until the serum of the blood destroys it. Just how the blood destroys the infection is a matter of controversy and has not been established at the present time.

The use of the vacuum cup is very interesting. In applying them over carbuncles, they help to give drainage through smaller incisions than used to be employed, and, in place of having the resulting large granulating surface, the skin over the carbuncle can often be preserved.

I think we should be guarded against the use of Bier's treatment at the expense of other well-recognized forms of treatment, and that in the presence of suppurating infections, especially of streptococcic origin, incisions sufficient for free drainage should be made.

Gastro-Jejunostomy: Its Development, Conditions to which it is Applicable, and its Results.

EDWARD WEIR SMITH, M.D., MERIDEN.

When Wolfler in 1881, just in the dawn of aseptic surgery, first did a successful gastro-enterostomy, he started a chapter of surgery which is proving to be one of its brightest and best, through the restoration to health and saving of life by an interesting and artistic procedure.

He joined the intestine to the anterior wall of the stomach, and that operation still bears his name. Von Hacker introduced a variation by fixing the jejunum to the posterior wall of the stomach. These were both loop operations. The anterior required twelve to twenty inches of jejunum to make the loop, while the posterior required but four to six inches. But in both there occurred too frequently, for the peace of mind of the surgeon and amiability of the patient, that distressing condition of vomiting of bile and pancreatic secretion which was called the "vicious circle."

Various changes were proposed and tried to overcome this defect. Wolfler, himself, divided the jejunum, fixing the efferent end to the stomach and the afferent end to the efferent portion, a few inches below its stomach attachment. Kocher introduced his "valve method," forming his valve from the wall of the stomach, to prevent the reflow from either part of the intestine.

To mention by name all of the surgeons who attempted to solve this problem and recite the ingenious mechanical principles they applied to it would, although interesting, take too much of your time; but it all goes to show how much interest was taken in this problem, on the successful solution of which the welfare of so many of the afflicted depended.

Finally, the posterior no loop operation, as proposed by Peterson, was taken up by the Mayos about three years ago, and they have demonstrated in their work that in this operation the least change is made in the anatomical relations of the stomach and intestines, and what is of no small importance, the whole of the absorbent and assimilating function of the small intestine is retained.

The anterior loop operation, as now done and advocated by Patterson, is a good operation. He gets excellent results, as by using extra sutures to keep the jejunum from dropping away so quickly from the stomach, the kinking is obviated and the "vicious circle" avoided. This is particularly useful when from adhesions the posterior operation becomes difficult and dangerous. The mechanical problem seems, therefore, to be solved. the posterior no loop being the operation of choice where feasible, and the long loop anterior giving good results where indicated.

The development of the method of making the anastomosis also took time to perfect. The different suture methods—the bone bobbin, Senn's bone plates, Murphy button, McGraw ligature—each had its day, but the suture method, as now used by W. J. Mayo, improved during the last year, seems to leave nothing to be desired.

Linen and Chromic Catgut. Linen is used for the serous and muscular coats; chromic catgut for through and through and mucous membrane. Then the length of incision in stomach and intestine, that is, the size of the anastomotic opening, had to be determined. From one inch and even less up to four inches was tried, until a two and one-half inch incision has been settled on as sufficient but not excessive. Our surgeons have, therefore, brought the operation to a pretty satisfactory state of development.

CONDITIONS TO WHICH THE OPERATION IS APPLICABLE.

This is essentially a drainage proposition; it is therefore applicable to all cases where symptoms calling for relief are due to stenosis of the pylorus, and deficient motility of the stomach, also where it is necessary to put the pyloric end of the stomach

and upper part of duodenum at rest. Its greatest field of usefulness has been in those cases of chronic indurated ulcer, so common in the pyloric region, and which have been refractory to medical treatment; cases which go the rounds with stomach trouble, benefited by rest, diet, alkaline and lavage treatment, but which never get quite well—often hæmorrhage both from stomach and bowel; that from the bowel being dark, tarry and granular. But I am not going into the question of diagnosis, I only wish to accentuate this particular class of cases with a history of years, who have been cured (i. e., received a respite) over and over again.

A man whom I met at the Mayo Clinic in Rochester, Minnesota, affords a good example of this class of cases. For ten years he had had stomach trouble and could work at his occupation of farmer but half the time. He had been cured twice with X-ray, three times by having his stomach washed out daily, for varying periods, but still he had trouble—pain, gas, etc. Operation showed a large indurated area just on duodenal side of pylorus.

Seven years ago I attended J. C. for hæmorrhage of stomach and bowel. He had a previous stomach history of about ten years. With rest, diet, etc., he got better, but not well—pain, gas, acid, acrid, eructation, vomiting at night, more or less constant, with intervals of tolerable existence. A little over a year ago he had another attack of hæmorrhage, very severe, and nearly died. After partial recovery, he submitted to an operation. The duodenum presented the indurated area of an ulcer the size of a silver dollar.

A girl, fifteen years old, on whom gastro-jejunostomy had been done a year ago, presented at the Mayo Clinic, with a history of almost constant vomiting, and some pain; the vomit mostly bile. She talked a good deal of her troubles. On opening, Dr. W. J. Mayo found a very pretty anterior anastomosis, but no sign of ulcer; the pylorus wide open. He simply undid the former operation and took occasion to remark, that in most of the cases where the operation failed to cure, there was no ulcer, the trouble was in the head,

or the stomach symptoms due to reflex causes, such as appendix, or gall bladder, or even eye strains, sometimes setting up a train of stomach symptoms very misleading, and the operating on such cases was what was discrediting surgery to-day. Anyone he said who could make him operate where he could not demonstrate the ulcer, could sell him gold bricks and mining stock. This illustrates a class of cases where the operation is not applicable.

There occasionally occurs another class where another operation is better; that is in indurated ulcer of the stomach, where the pylorus is open and resection of ulcer will not interfere with motility or caliber of pylorus; then resection of ulcer instead of gastro-jejunostomy is the operation of choice.

RESULTS.

The operative mortality of gastro-jejunostomy, as now done, is about one per cent. While I was at Rochester, April 28, 1908, Dr. W. J. Mayo gave us the report which he had compiled on after-results, that is, all cases who had been operated on over two years.

Of these, with complete records, there were 378. In sixty-four of these no ulcer had been demonstrated at time of the operation. Of these sixty-four cases, eleven came to second operations. Of these eleven, two had ulcer, nine had none. Thirty-eight per cent. were cured, twenty-two per cent. were improved and thirty-three per cent. were not improved. These are the results in the cases in which no ulcer was demonstrated at operation. In 313 cases in which ulcer was demonstrated, eighty per cent. were cured, nine per cent. improved, six per cent. unimproved and two, only, died of stomach trouble. In the last 300 cases there had been a mortality of less than one per cent., and of these 300 only three had to have any subsequent operation up to date.

How does the person operated on feel after the operation? For in the final summing up the attitude of the patient to the operation and the effect on his body and mind may condemn or justify it.

In my experience there are no more grateful patients.

J. C.'s son, seventeen years old, said he had never known his father before. The sick, unhappy man of 120 pounds weight, which he had known as father since childhood, had changed to a happy, good feeder and feeler of 157 pounds.

This is the man who, in urging another case, with a four years' history of misery, to have the operation done, said to him, "I can eat apples."

This case also submitted to operation. An indurated area, the size of a quarter, with adhesions presented on duodenal side of pylorus. The no loop posterior gastro-jejunostomy was done. He walked out of the hospital on the twelfth day, gained nine pounds the following week, and went to his work in the factory the twenty-first day and has felt fine ever since.

In conclusion: We have in gastro-jejunostomy a safe operation, which, in the cases to which it is applicable, gives most excellent results, pleasing alike to surgeon and patient.

DISCUSSION.

DR. JOHN B. BOUCHER (Hartford): I am sure we all owe a debt of gratitude to Dr. Smith for bringing before us this very interesting and important subject.

It is unnecessary to discuss the various forms of gastro-enterostomy which have been done since Billroth performed the first operation in 1881. Suffice it to say, that the operation of choice at the present time is the posterior no-loop gastro-jejunostomy, with the descending jejunum lying in normal position; namely, downward and to the left, thereby neither disturbing the relations of the stomach nor of the jejunum. This operation gives us excellent results and is all that can be desired. Formerly, we thought it was necessary to turn the jejunum toward the right, in order to correspond to the peristaltis of the bowels. We have found by experience that this is entirely unnecessary; in fact, not desirable, as the short turn of the jejunum toward the right has been frequently followed by kinking and adhesions. To my mind, the good results obtained in gastro-jejunostomy are not from the emptying of the stomach alone, but from the diminished amount of hydrochloric acid in the stomach. How is this brought about? It is simply by the emptying of the acid secretion into the jejunum early, thereby increasing the time of digestion in the jejunum at the expense of lessening the time in the stomach. I believe this is the whole secret of the cure of gastric ulcer. There are many theories advanced, but I will not discuss them.

In regard to the choice of operation, or the cases in which operation is more applicable, there is no question but that our best results are in cases where we can demonstrate gastric ulcer and pyloric contraction or obstruction. But we must remember that there is a small class of cases in which we have all the signs and symptoms of gastric ulcer, including hæmorrhage, constant pain and inability to take food, where patients are practically invalids for years, and still, on the operating table, we cannot demonstrate an ulcer or contraction. Usually there is some dilatation of the stomach. These cases are chronic sufferers and medical treatment has been tried to its full extent and failed. What are we going to do with this class of cases? In my own experience, in sixteen cases, I have had three of such, two of them the worst I have had to deal with, where I could not demonstrate a lesion, and still a posterior gastro-jejunostomy has relieved and cured them, as one of them extends over a period of three years, and the others nearly two years. In one case that has suffered for years and was practically an invalid, at the operating table a careful examination of both walls of the stomach failed to show induration, or other evidence of ulceration. In this case we did a posterior jejunostomy, because there was nothing else to do, and accidentally found an ulcer, in which the mucous membrane of the stomach was shattered and ulcerated to the size of a quarter of a dollar, and still no lesion could be demonstrated before the stomach was opened. I believe there is a small class of cases in which we cannot demonstrate a lesion, even on the operating table, and a large percentage of these cases will give us good results with a gastro-jejunostomy. Even though we may have an occasional failure, it seems to me that the operation is justifiable, at least, until we can find some other means of relieving this class of sufferers.

I would like to continue the discussion of this very interesting subject, but our president says there is only one minute left.

In conclusion, I will say, I believe we have in gastro-jejunostomy, as done at the present time, an operation which, in properly selected cases, is one of the brightest stars in modern surgery. I know of nothing that will give more pleasure to the patient, his family, friends, and the surgeon, than to take one of those cases of chronic gastro ulceration that has suffered for years, and, with this operation, restore him to perfect health in three or four weeks, giving him a new lease of life and making him a happy member of his family and a valuable member of society.

DR. OLIVER C. SMITH (Hartford): Mr. President and Gentlemen: Dr. Smith is to be congratulated upon his graphic presentation of this subject. I only wish that all of our cases might be as happy in their results as those which he has related.

I heartily agree with the last speaker that the most important factor is to know when to operate. What are the indications for operation? All are practically agreed that gastric stasis, due to the chronic con-

stricture of the pylorus, is the prime indication. Hæmorrhage of the stomach is not always an indication for gastro-enterostomy. For instance, the hæmorrhage may proceed from dilated veins at the cardiac end of the stomach, caused by hepatic cirrhosis, or it may be due to the round peptic ulcer of Cruveilhier, or it may be the result of the general oozing of blood from the mucosa described by Dieulofoy. These conditions should not be considered surgical and are better left to the general practitioner.

Hæmorrhage due to chronic ulcer, on the other hand, is a surgical condition. To determine the nature of the hæmorrhage is not always an easy matter. If the patient has had dyspeptic symptoms for a long period and has lost flesh, we are led to suspect that the hæmorrhage proceeds from chronic gastric or duodenal ulcer.

Chronic gastric or duodenal ulcer, which has resisted medical treatment and careful dieting for many weeks, is next in importance to pyloric stenosis as an indication for gastro-enterostomy. Malignant disease of the stomach, with or without the performance of gastrectomy, calls for gastro-enterostomy in both the palliative and curative operations. It is unfortunate to operate for hysterical vomiting, or for the splashy stomach of neurasthenia. These patients do not improve after the operation and are quite likely to be made worse and bring discredit upon the procedure.

As to technique, nearly everyone engaged in this work is now agreed that posterior, no-loop, gastro-jejunostomy is the operation of choice. The leading exponents of the operation in England and America, Mr. Moynihan, Mr. Robson and the Mayos, are agreed as to this, and practically their only difference now seems to be as to the direction of the line of attachment of the jejunum to the stomach, the English surgeons preferring a vertical attachment and the Mayos attaching the jejunum with its long axis from above downwards and to the left. It is probable that varying observations as to the course of the jejunum from the flexure are due to the anatomical variance in the length of the mesocolic band. If this band or ligament is short, the jejunum would appear to turn to the left, and if long, it may be carried to the right. The Mayos teach that when this ligament is long it should be stripped back from the jejunum and the raw surface resulting used for the anastomotic opening to be attached to the stomach. Mr. Moynihan concludes that one line of attachment is as good as another, provided, always, that no twist be given to the jejunum at the time anastomosis is made. The size of the opening should be from 4 to 6 cm. At the Vienna clinic a smaller opening is made, and there, too, the operation is performed without clamps, the viscera being held in position by sutures, introduced from the wall of the stomach and jejunum to the margin of the aperture in the mesocolon. Aside from there being more hæmorrhage and occasional soiling, the operation seems rather quicker and more simple. It is important that the anastomosis should

be large enough for free passage from the proximal to the distal opening in the jejunum, and from the stomach to the distal opening in the jejunum. The mucous membrane suture should be of fine chromo-sized or tannated catgut. The use of linen or silk for this tier is sometimes followed by long-continued ulceration and dangling of suture material in the intestine. Celluloid linen for the upper tiers is the material of choice.

Among the unfortunate sequellæ of gastro-enterostomy may be mentioned, kinking of the jejunum, vicious circle, or the persistent emptying of bile into the stomach from the proximal limb of jejunum, peptic jejunal ulcer, hæmorrhage and adhesions. Kinking and the vicious circle are much more rarely encountered now than formerly, due to improved technique and the avoidance of the jejunal loop. In our last ten operations we have had no vomiting of bile. It is not clear, at present, how peptic ulcer can be guarded against. At present it must remain one of the unfortunate but rare sequellæ.

One commencing this line of work will do well to serve first as assistant at the operation to one of large experience, for while it looks easy and sounds easy while being discussed, its proper performance requires practice and one should become thoroughly familiar with each step before attempting it upon the living human subject.

In properly selected cases, it is certainly an excellent operation, one of the best that has been brought forward in abdominal surgery during the past century, but it has its limitations and must be employed scientifically and judiciously, in order that it may maintain its reputation.

DR. JOSEPH M. FLINT (New Haven): After the very able paper and still more able discussion, I hesitate to speak further on this subject. In fact, there is only one point that occurs to me which is of general surgical interest.

While I was working in von Eiselsberg's clinic, I had an opportunity of seeing him operate on a very remarkable case. This was one on which Czerny, a year before, had done gastro-jejunostomy for an inoperable carcinoma of the stomach. There was undoubtedly, at the time of the operation, no question that the growth was inoperable. It was a slow-growing tumor, originating from an old gastric ulcer, which had caused the deposition of a great deal of inflammatory tissue on the walls of the stomach and adjacent structures. The removal of the irritating influence of the gastric contents, by means of a posterior gastro-enterostomy, had caused the absorption of the adhesions and a reduction in the size of the tumor. As a result, twelve months after the first operation, the tumor had become so localized as to justify an attempt at its removal. This case I followed for at least five months after the operation and in that time there was no evidence of recurrence. Of course, the secondary operation was much simpler, inasmuch as half of the operation was already done by the gastro-jejunos-

tomy. It was merely necessary to resect the pylorus and suture the walls of the stomach and duodenum and the operation was complete.

At that time the general interest in gastro-enterostomy was more acute even than it is at present, and I undertook a series of experiments to determine the nature of the healing of these wounds.

Surgeons, naturally, have much more familiarity with the healing of superficial wounds, for they see them in all their cases; but it is of importance, also, that they should know how the healing occurs in these internal wounds as well.

I performed a series of anterior gastro-enterostomies on dogs and then killed the animals at successive periods following the operation. In general, I can summarize the results by saying, that up to the seventh day the healing process, so far as the mucosa is concerned, is one of necrosis. That is to say, that there are degenerative changes going on in those parts of the intestinal and gastric mucosæ adjacent to the new opening established between them. The extent of this necrotic process seems to depend on the disturbance with the blood supply in the field of operation and may be greater in some cases than in others. About the seventh day, there really comes to be a line of demarcation between the tissue that is saved and the tissue that is destroyed. If one cuts a section of a healing gastro-enterostomy at that time, one notes that the union between the serosæ of stomach and intestine is already firm. Between the normal gastric mucosa, on the one hand, and that of the intestine, on the other, there is an area composed of fibrin and young connective tissue cells, which must be covered with mucosa before the anastomotic opening is healed. About this time the regeneration of the mucosæ has begun to appear. On the stomach side, the gastric glands begin to send out over this denuded area a layer of flattened epithelial cells which look much like endothelium. From the crypts of Lieberkühn, the same process is repeated on the intestinal side. At about the fourteenth day, these two types of epithelium have met and the denuded portion of the ulcer is covered in. On the gastric side, the new gastric glands are regenerated by down-dippings of this layer of epithelium, which give rise to new gastric glands, while on the intestinal side new crypts are formed in a similar manner. Villi are formed by upgrowths between the crypts, and, at the fourth or fifth month, the integrity of the mucosa is fully reestablished.

I think that the study of this healing process has a certain amount of practical bearing. In view of the state of repair of our newly established opening, we ought to be extremely careful of the diet of our patients, as long as there is any ulceration about the anastomosis; that is to say, for two weeks, the diet ought to consist of liquids or soft foods. It is extremely dubious whether the practice of some surgeons, who allow their patients a practically unrestricted diet on the fifth or sixth day, would not prolong the healing process. The ulcer around a healing anastomotic opening logically calls for the same treatment dietically as an ulcer in any other portion of the stomach.

Prognosis in the Suture of Nerves.

ERNEST A. WELLS, M.D., HARTFORD.

The immediate suture of the ends of a nerve accidentally divided is so obviously demanded and so easy that it were but a waste of words and an insult to the judgment of any physician or surgeon to urge such practice. The pathological problems involved, the peripheral changes, the distribution of the paralysis, the areas of anæsthesia, the prognosis, etc., are matters of the utmost scientific interest, and matters many of which still remain unsolved, but the indication is clear. I venture to say that the surgeon who closes a wound and leaves a principal nerve with its two ends apart is guilty of malpractice.

The secondary suture of *previously* divided nerves, however, is a matter for deliberation. Each case must be studied by itself; and for any surgeon to so equip himself as to be prepared to offer advice in such a case, requires deep study and a very careful examination of his patient. I do not approve of the lazy practice of throwing all the responsibility for these operations onto the neurologist, expecting him to dictate just what shall be done, and, if the case turns out badly, to bear the brunt of the criticism. Our best neurologic surgeons are excellent neurologists as well as able surgeons. Indeed, it is largely through their contributions that our fund of neurologic knowledge is growing. Neither should we, in a routine fashion, turn these cases over to the orthopedist for operation, unless he is at the same time a surgeon of experience and painstaking technique. The secondary suture of nerves is an operative procedure of the most delicate sort and demands an intimate and profound knowledge of the healing of wounds, nicety of approximation, prevention of scar tissue, etc. In other words, the path to neurologic surgery should be through neurology, and the path to operative orthopedics should be by way of general surgery.

An intensely interesting group of cases is that in which the section, readjustment and anastomosis of peripheral nerves is undertaken for the cure of certain forms of paralysis, where the causative lesion is within the central nerve system, or at least at a distance from the region paralyzed. A typical example of this is in the permanent paralysis resultant upon acute anterior poliomyelitis. In many of these cases, as you know, the paralysis is limited to a certain definite group of muscles, as for instance, the peroneal group of one leg. The cause has been an acute inflammation of the anterior horn cells of the spinal cord. Most of these cells have recovered. But those whose neurones pass by way of the external popliteal nerve to the peroneal muscles suffered the worst, and, instead of recovering, have gone the other way and degenerated completely. Their neurones, making up the external popliteal nerve, have degenerated, and this group of muscles has atrophied more or less completely. The patient has the familiar gait in which dorsal flexion and pronation of the foot are impossible. But just beside this paralyzed nerve, in the upper part of the popliteal space, lies a large and thoroughly healthy nerve, the internal popliteal, supplying the calf muscles and the plantar flexors of the foot. Suppose we divide the useless external popliteal and plant its peripheral end into the healthy internal popliteal. Union takes place; fibers grow down from the internal popliteal, and the muscles regenerate. Nerve cells in the spinal cord formerly presiding over flexion of the foot now find themselves extending the foot. Coördination of movement is gradually acquired. New paths of connection are established with the higher centers, and with the cortex of the brain; and the patient is cured.

The above is the type of what is meant by the anastomosis of nerves for the cure of paralysis, and represents one of the most recent advances of surgery. Practically all the literature on this subject has been published within the past ten years. It is fairly voluminous, and yet the number of cases reported is still comparatively small. I believe that this will not long be the case, because the number of cases one sees that would

seem to be amenable to this procedure is large, and increasingly so as one's attention is drawn to the possibilities offered.

During the past few months a number of cases, including anterior poliomyelitis, obstetrical, traumatic and operative palsies, have presented themselves at my office in a general surgical practice, seeking advice for conditions in which a nerve suture of one sort or another was to be considered. If I give you a brief summary of the first and most difficult of these cases, the points at issue will be made clear.¹

A. B., aged ten, was very severely burned about the legs and thighs about six years ago. During a convalescence which seems to have extended over a period of four years, there were a number of operations performed by various surgeons, for the purpose of straightening the left knee, which had suffered severe contracture from the formation of scar tissue. The hamstring tendons were probably severed. She now has a complete paralysis of all muscles supplied by the external popliteal, as well as an anæsthesia throughout the distribution of the same nerve. In fact, this anæsthesia seems also to overlap some of the area supplied by the internal popliteal; and the calf muscles and flexors of the foot are not as strong as one would expect. Electrical response in *these muscles* is sluggish and suggests the reaction of degeneration. There is no electrical response at all to be elicited from the anterior muscles. It seems most likely that the external popliteal, and perhaps part of the internal, was severed at the time the hamstring tendons were cut. The paralysis was not noticed by the parents until after the last operation, and was not mentioned by the surgeon prior to that operation. It may be, of course, that the nerves have become so involved in scar tissue as to interrupt their function, or the paralysis may have been due to the pressure of plaster casts, splints, or something of that kind, but this seems unlikely.

¹ I finally advised this patient that operation on the nerves in her case would be unwise as the paralysis was too extensive. I did advise and expect to carry out a tendon transplantation.

At any rate, it was the consideration of the operative possibilities in this case that prompted the course of reading that has resulted in this paper, and what I propose to consider now is what we may hold out to these people as the immediate and end results of such operative interference—the “prognosis in the suture of nerves.” They get along fairly well with their braces and shoes. It takes a long time to get results from nerve suture. How long? Is it worth while? Their paralysis is of long standing; is it therefore too late? And if not too late, will recovery be so much the slower because of this tardy beginning? What has been done by other surgeons? How long does it take to get results? What is the first sign of functional return? And when may this be expected? What are the signs that an operation will be of no avail? Does recovery come first in the vicinity of the suture and later spread to the periphery? Is the final result better than that obtained by tendon transplantation? An endless number of such questions come crowding for an answer. I confess I have been disappointed in the definiteness of the answers I have been able to find. Yet nearly every writer on the subject bewails the same fact. The very nature of the results, as for instance the return of sensation, is such that it admits of very little accuracy of statement. And the reports of most surgeons are so inadequate, both as to preoperative conditions and postoperative results, that it is very difficult to deduce precise conclusions.

It is unnecessary to go into the microscöpic changes in the peripheral nerve resultant upon disease or injury. There is a voluminous controversy on this subject not yet settled. The neurone theory, universally accepted since the time of Waller in 1852, has been called in question by painstaking and able investigators. It is admitted by all that if a peripheral nerve fiber be separated from its nerve cell it will invariably degenerate. The process is about as follows:

The nuclei of the sheath are increased in size, the connective tissue cell itself increases in size, encroaches upon the myelin sheath and axis cylinder, until finally it completely divides and

sub-divides them until they are broken up into fine fatty globules, which are gradually absorbed by the surrounding tissues. In the meantime the sheath shrinks until it becomes merely a fibrous cord. Gowers states that after section of a nerve in a rabbit the first changes are visible at the end of twenty-four hours, the first complete interruption of the myelin and axis cylinder below the point of section occurs about the end of the second day; the process of destruction is considerably advanced at the end of the fourth day, and is finished and the multiplication of nuclei ceases toward the end of the second week.

This process of secondary degeneration occurs more slowly in the rabbit than in a bird and seems still slower in man, in whom it is probable that complete segmentation does not occur until between the fourth and eighth days. (Gowers, p. 68.)

But this process, as well as the time it takes, must vary with the nature of the primary lesion. Regeneration may occur after the degeneration is over, and in the case of sectioned nerves, if the ends be placed in careful apposition and allowed to heal by first intention, this will probably occur. It is a slow process, occupying the second and third and fourth months after division. The neurilemma proliferates until it gives the fiber a cellular and embryonic appearance. But according to the *central school*, and in accordance with a strict interpretation of the neurone doctrine, regeneration goes no further until the severed ends of the nerve come in contact and a new axis cylinder can grow down from the central end of the old nerve along the course of this embryonic fiber. This ultimately becomes covered with myelin. The amount that Nature will do to bring about the regeneration of a peripheral nerve is amazing; and it sometimes seems that when we want it least is just the time when it is most certain to regenerate, as in those cases, for instance, of facial neuralgia, in which the branches of the fifth nerve are resected. Still, we must remember that for some unknown reason sensory fibers always seem to regenerate more quickly and certainly than motor fibers, and motor fibers, in turn, more quickly and certainly than secretory fibers.

Up to the time of Nasse and Waller (1852) it was generally believed that regeneration simply meant the formation of connecting bits of tissue between the ends of the severed nerves. That such is the case is practically the point of view of the present so-called *peripheral school*. This school believes that after a peripheral nerve, severed from its central connection, has degenerated, it regenerates from the proliferated connective tissue cells of the Sheath of Schwann, and does so completely; that the axis cylinder processes are bipolar outgrowths from these cells, and that these delicate filaments coalesce end to end, and finally form a true axis cylinder that is only waiting for complete restoration of function till such time as it shall again make connection with its central end. This school is led by Bethe, Held, Dogiel, Nissl, Dohm, Schultze, Ballance and Stewart, Murphy and others. A very considerable literature has sprung up on this point, which, however, it is not within the province of this paper to discuss further. Those interested are referred to Bethe's article: (Bethe: *Albrecht Archiv für Psychiatrie und Nerven-Krankheiten*, 1901, Bd. xxxiv, p. 1066).

It is also of importance to consider the effect of section of a motor nerve upon the *muscle* it supplies. Histological changes commence in or after the second week. The muscular fibers become narrower and may be reduced ultimately to one-third of their normal width; the transverse striations become less distinct and the cells themselves cloudy, granular, fatty, or simply atrophic, according to different authors. Meanwhile, the nuclei of the sarcolemma and of the interstitial tissue become increased in number, and very gradually the muscle tissue is replaced by scar tissue with its contraction, atrophy, and permanent shortening. In most lesions of nerves, other than actual division, some fibers recover, and in such cases the above muscular changes are more or less arrested and the normal conditions may be gradually restored. Most important, however, is the fact that the nuclei are fairly well preserved, the changes being chiefly those incident to non-use. The seeds are still there, waiting for favorable conditions to once more regenerate their parenchyma and restore the muscles as before.

As to the time required by these changes: in the case of complete and permanent damage to a nerve, the muscle's faradic irritability rapidly decreases and is utterly lost in about three to four weeks. The galvanic irritability is at first also decreased, but at the end of the second week it rises considerably above normal as compared with the opposite side; it then gradually decreases, reaching normal again in about ten months and utterly disappearing in about two years.

Up to that time more or less return of function can be fully expected if repair is possible at the lesion of the nerve. To what extent a muscle may be expected to recover after it has lost *all* irritability to ordinary electrical shocks, is a matter not yet settled. Certain clinical cases, as we shall see, seem to indicate that much in the way of return of function may be hoped for even many years after. The so-called "reaction of degeneration" consists in a more deliberate response of the muscle to galvanic makes and breaks, and in the fact that the anodal closing contraction becomes stronger than the cathodal—the reverse of the normal. Clinically, I believe these are the easiest and most satisfactory ways in early cases to tell whether and to what extent an atrophic process is taking place in muscles. These basal facts are of importance.

Now comes the question—what has actually been done?

In the *Philosophical Transactions of the Royal Society of London*, issued in 1795 (p. 177), along with papers on "The Theory of Motion and Resistance of Fluids," "The Nature and Construction of the Sun and Fixed Stars," "An Account of the Late Eruption of Mt. Vesuvius," and "New Observations in Further Proof of the Mountainous Inequalities, Rotation, Atmosphere, and Twilight of the Planet Venus," we find an article entitled "Experiments on the Nerves, Particularly on Their Reproduction; and on the Spinal Marrow of Living Animals," by William Cruikshank, Esq., communicated by the late John Hunter, Esq., F.R.S., which paper was originally read before the Society, June 13, 1776. He says:

On January 24th, 1776, I divided, in a dog, one nerve of the par vagum, with the intercostal (sympathetic) on the right side. . . . On the eighth

day he . . . seemed perfectly to have recovered. On February 3d I cut out a portion of the two nerves of the opposite side, in the same dog; the piece might be about an inch long. . . . The seventh day after this second operation he was found dead. . . . In the dead body the divided nerves of the right side were united by a substance of the same color as nerve, but not fibrous; and the extremities formed by the division were still distinguished by swellings, rounded in the form of ganglions. The same appearance had taken place with respect to the nerves of the left side; though the divided extremities seemed to have been full two inches apart; the uniting substance was more bloody than that of the other side.

Here, then, he had demonstrated gross anatomic union of the nerves at the end of seven days, even though an inch had been excised; and better union on the other side at the end of seventeen days. He remarks later (p. 181):

I suspected that the reason of the dog's dying so soon was that none of the nerves had yet acquired the power of their former offices; and that were the operations performed at a greater distance of time the animal would recover. With this idea I was led to repeat my experiments, allowing a greater interval to take place between the first and second operations.

On March 6 he repeated this experiment, allowing an interval of three weeks. On the nineteenth day of the second experiment, the animal being in fairly good health, Cruikshank assumed that function had been resumed, and killed the dog by bleeding. He found the divided nerves on each side perfectly united; he says he thinks the regeneration of the nerves "fully proved." These experiments present many problems that make them difficult of interpretation. It seems that the antivivisectionists were even then a thorn in the flesh, for he concludes:

If, in the opinion of the judicious, these experiments have a tendency to be useful to mankind, the author will forgive those censures which unphilosophic severity may throw on him, whilst it views only some unavoidable circumstances attending the performance of them.

And the graphic accounts of his experiments *do* cause a shudder when we remember that they were performed nearly a century before the discovery of anæsthesia.

In these same *Transactions of the Royal Society*, but recording experiments made twenty years later, we find "An Experimental Inquiry Concerning the Reproduction of Nerves," by John Haighton, M.D., read February 26, 1795. He made many experiments to determine the time necessary for the vagus to sufficiently regenerate to perform its functions. He found nine days too short, although the dog of this experiment lived for thirteen days. After a three-day interval a dog lived four days.

"But," he says, "to mark the precise point of time where the line is to be drawn would require the sacrifice of more animals than a question of mere curiosity could justify."

Consequently, in his next experiment he "allowed six weeks to elapse" before severance of the nerves of the two sides. He describes symptoms referable to the incomplete action of the vagi over a period of six months, after which the dog had recovered his health. Therefore, six weeks was sufficient for recovery of function enough to sustain life, and six months was the time necessary for complete recovery. This applies, of course, to dogs, and to the vagus nerve. The animal's voice recovered with other symptoms, and in six months was practically normal. Haighton then proved that this resumed function was not due to any roundabout anastomosis through other nerves by a second time cutting both the vagi. The dog immediately died (that is, in two days), as many others had done following a primary section. A superior piece of logic, clearer cut, or better expressed, than this article of John Haighton's, I have never read. Similar experiments have been made more recently by Gluick and Bakowiecki, but without knowledge of the work of Cruikshank or Haighton. Gluick found that if an interval of eight days were left between the sections, an animal lived about fifty hours longer than if the two vagi were cut simultaneously. He could not, however, inhibit the heart through his regeneration. There have been many contrary results by other observers.

In 1824 Flourens (*Recherches Experimentales sur les Fonctions du Systeme Nerveux*, 1824, p. 272) performed his oft-

quoted and classical experiment to prove the possibility of crossing two motor nerves, supplying opposite groups of muscles, with restoration of function. It seems that in the cock the two principal branches of the brachial plexus go to the two opposed surfaces of the wing. Flourens crossed the nerves, and after several months the cock was able to use the wing as before. Flourens exposed the nerves again and found the union perfect; and sensations of pain were transmitted past the point of union.

In 1838 Schwann (*Muller's Elements of Physiology*, Vol. 1, 1838) endeavored to determine whether sensory fibers could establish functional connection with motor fibers. His results were against any such union, and this result has been confirmed by many others, including Bidder (*Versuche über die Möglichkeit des Zusammenheilens functionell verschiedener Nerven-Fasern*), and Gluge and Thiernesse (*Bulletins de l'Académie Royal de Belgique*, Vol. 7).

In 1892 W. H. Howell and G. C. Huber, at that time of the University of Michigan, wrote an exhaustive essay (*Jour. Phys.*, Vol. 13, p. 335, 1892) on "The Possibility of a Union and Return of Function in Severed Nerves without Degeneration of the Distal Portion," and "The Possibility of Union and Return of Function Between the Central Portion of Any One Spinal Nerve and the Distal Portion of Any Other." In the experiments from which they drew their conclusions they used the median and ulnar nerves in dogs. The operations were performed with the utmost precision; they carefully dissected the nerves free from surrounding structures, then severed or crushed them and made electrical tests to prove the paralysis complete. Conclusions drawn from the observation of these animals as to the return of motion and sensibility were found unsatisfactory, so the nerves were again exposed, and in some cases the muscles, too, after proper intervals of time, and the nerves stimulated above the old line of suture. This gave very accurate results. Their conclusions were that primary union, in the sense of return of function without secondary degeneration, never occurs; that loss of irritability and conductivity

ensues in about four days; that all peripheral ends degenerate; that irritability and conductivity return in about twenty-one days; that this return is slightly better where coaptation is best, namely, where the nerve fiber was crushed as compared with where it was cut and sutured; that return of function was still slower where the nerve was destroyed for a distance of an eighth of an inch or more; and that irritability appeared first in the vicinity of the wound and spread peripherally, *pari passu* with increase in the number of fully formed fibers. Function seemed to return to the sensory fibers ahead of the motor. This, however, is susceptible of several interpretations, as the end organ in one case is the healthy brain, while the motor nerve cannot *show its* return of function until its end plate and muscle have also recovered. The peripheral nerve, from the third to the seventh week after suture, has the appearance of an embryonic fiber; that is, the fibers are simply membranous sheaths containing protoplasmic matter, but no axis cylinder and no myelin sheath. Mechanical stimulation at this time is more efficacious than electrical. Conductivity returns before irritability; that is, when a regenerating peripheral end is still not irritable, it will conduct impulses due to stimulation of the fiber above. Perhaps it may conduct normal impulses or reflexes even earlier; and this may *also* be true of *real* embryonic fibers, for all we know. Function began about the twenty-first day; it was not perfect in seven weeks, but was nearly so in eleven weeks. Shorter fibers do not necessarily return first. Rapidity of return seems to depend more upon accuracy of union than distance, for the distribution of the return is entirely irregular. A crossing of two distinct nerves was proved possible, but results seemed a little slower in making their appearance than in simple suture. Probably this should not be so, as Robert Kennedy of Glasgow has recently shown that whether it be a simple suture, or the nerve be turned upon its own axis through 180° before suture, or an anastomosis with another nerve be done, the time for return of function is approximately the same (*Phil. Trans. Royal Society of London*, 1901, Series B, t, cxiv, p. 127). The time

necessary for the reestablishment of coördination is undoubtedly proportionate to the degree of accuracy in approximating the nerve ends with their constituent fibers in their original relations. For the return of coördination depends on the readjustment of reflex paths in the central nervous system, and the very delicate movements which represent the highest degree of coördination are said never to return after nerve suture. Kennedy has also shown that after crossing of flexor and extensor nerves, nerves whose muscles are directly antagonistic to each other, irritation of the flexor center on the cortex produces extension and vice versa (*Kennedy*, p. 751). Cushing doubts whether this really means a complete interchange of function between the cortical centers: to take a fácio-spinal accessory anastomosis for an example, it seems inconceivable to him that the small area of the cortex ordinarily presiding over the comparatively simple movements of elevation of the shoulder could take upon itself the exceedingly complex expressional and other movements controlled by the extensive area of the cortex devoted to the face. His patient, in the midst of associated movements of the face and shoulder, was able to bring about independent expressional movements of the face; and it would seem that these must have originated in the former area and been transmitted secondarily to the spinal accessory centers, either in the cortex or medulla.

In the 1893 issue of the *Journal of Physiology* (Vol. xiv, p. 21) Howell and Huber collected eighty-four cases of *primary* nerve suture: of these they classified thirty-five as successful, thirty-four as improved, and fifteen as failures. Fifty-seven were observed long enough to admit of regeneration; twenty-six too short a time. The average time for the return of sensation was from one to three months; the average time for the return of motion was from four to eleven months. These cases represented for the most part operations on the forearm.

Of cases of *secondary* suture (p. 47) they collected eighty: thirty-one successful, forty-one improved, nine failures. Sixty were observed long enough for regeneration to have occurred,

and fourteen too short a time. The average time for the return of sensation was from three to four months; the time for the return of motion was from six to ten months. These were mostly upper arm nerves. In their discussion of these results, they conclude:

From a clinical standpoint, then, it may be said that the prognosis in operations for secondary suture is good. Improvement is almost certain, and in a large number of the cases complete success may be expected.

It might seem at first glance that the next step in our discussion, namely, the anastomosis of different nerves, should be an entirely distinct subject; for it is not only necessary that the nerve regenerate to such an extent that it will again conduct impulses, but there must also be a readjustment of the cerebral cortex and a reorganization of reflex paths if motions are to be properly coördinated and sensations properly interpreted. But on second thought, and as I have brought out above in discussing Kennedy's experiments, this must be equally true of even the simplest primary suture. For each nerve is made up of countless individual fibers, each of which arises in its own individual cell, and each trained to its own particular duties. Reflex paths and habitual motor complexes must be disturbed quite as much by a redistribution of the individual fibers of a single nerve as by a crossing of the fibers of different nerves, with the single exception of greater distance. The distinction is one of degree then, not of kind.

Apparently the first operation undertaken clinically for the cure of paralysis was by Charles Ballance, at St. Thomas Hospital. This was an operation in 1895 (*Brit. Med. Jour.*, May, 1903) for the cure of facial paralysis, and was an anastomosis of the peripheral end of a paralyzed facial into the spinal accessory. This case was only partially successful. Murphy (*Surg. Gyn. and Obs.*, April, 1907), in an article in April of last year, tabulates thirty-four clinical cases of operation for the cure of facial paralysis, or tic. In twenty-two of these the facial was anastomosed with the spinal accessory, and in twelve with the hypoglossal. The arguments for the preference of one or the other of these nerves are as follows:

Associated movements, certain to occur in either case, are more troublesome in the case of the spinal accessory than with the hypoglossal, from the mere fact that the movements of the shoulder are in plain view, while those of the tongue are within the mouth. Excellent photographs of these movements will be found in the article by Ballance and Stewart, and in Cushing's article (*Annals of Surgery*, May, 1903, p. 641). Furthermore, the cortical center for the tongue is in the midst of the area for movements of the face, whereas the cortical area for the shoulder is much higher up in the Fissure of Rolando. It would seem then, *a priori*, that complete establishment of function would be more easily brought about through the hypoglossal than through the spinal accessory. The hypoglossal nerve is the larger, and therefore more easily sutured, but the spinal accessory is more available from its position. A paralysis of one-half of the tongue, an event which occurred at least three times in this series of twelve cases, is a rather serious feature; while a paralysis of the sternocleidomastoid and trapezius muscles is never serious. Many authorities, indeed, claim that certain of the fibers in the facial nerve, which close the mouth, may normally arise in the nucleus of the hypoglossal (Gowers, Tooth and Turner, Brugia and Matteuci). Professor Schafer of Edinburgh suggests the use of the glossopharyngeal, because of the close proximity of its motor nucleus to that of the facial: Cushing has suggested the use of one of the cervical nerves.

Taking the whole thirty-four cases, and I might add one more—a spino-facial anastomosis, in which I assisted Dr. Frank Hartley of New York, and which I believe has never been reported²—making thirty-five in all, there seem to have been twenty-six in which there was improvement, and four more that were too recent at the time of reporting to be

² M. McG., age 55, facial paralysis due to mastoid disease; duration of paralysis, three months; operation, January 15, 1902; end to side spino-facial anastomosis. Letter received March 11, 1908, six years after operation, from Manhattan State Hospital, describes the final result as a complete failure.

sure of. In fifteen voluntary control returned and in eight this had become independent of movements in the shoulder or tongue. Two, perhaps, warranted the lax use of the term "complete restoration," and six should be classified as failures. George Woolsey expresses the three degrees of recovery as follows (*Kee's Surgery*, Vol. 2, 727):

The first . . . is the restoration of the normal muscle tone and the symmetry of the face in repose . . . The next consists in the voluntary control of the facial muscles . . . A complete recovery would involve a restoration of expression and emotions. This is not to be expected, at least at all perfectly. It . . . would be more possible in young patients.

Without respect to location, Murphy says:

The invariable order in which restoration takes place is:

- (a) Restoration of the trophic energy of the tissues.
- (b) Sensation.
- (c) Motion.
- (d) Material increase of the substance of muscles.

The principles underlying the above operations for the cure of facial paralysis have also very recently been successfully applied to the cure of other forms of paralysis; notably for the residual paralysis of anterior poliomyelitis. Peckham (*Prov. Med Jour.*, January, 1900, p. 5), of Providence, deserves credit for having first carried out this procedure. His was a case of anterior poliomyelitis of ten years' standing. He grafted certain branches of the internal popliteal into the paralyzed branches of the external and obtained excellent results. He also carried out the same procedure in a case of paralysis resulting from a fracture of the spine. But his reports are unsatisfactory. The first well-reported case is that of Dr. J. K. Young, done in December, 1902. He made the musculocutaneous nerve supply fibers to the paralyzed anterior tibial nerve. Murphy, a year ago, collected thirteen cases, and to this number should be added the second of Peckham's cases, making fourteen cases in all. I am not aware that any cases of this sort have been reported since Murphy's paper.

Of these fourteen cases, twelve were for palsies of the lower leg, and two for paralysis involving the shoulder. Two almost warrant the term "cured," five were distinctly improved, two were failures, and five too recent to classify. Spiller says this operation "has passed the experimental stage."

The principles of nerve anastomosis have been applied also to lesions of the brachial plexus, in which one or more cords have been torn apart close to the vertebral foramina, either at birth or by some subsequent trauma. Spiller and Frazier have applied it for the relief of athetosis. Murphy records one case in which the paralysis had existed for twenty-four years and no electrical responses whatever could be gotten from muscles below the elbow. Yet he found the nerve trunks beyond the point of injury "of fully developed adult size"; and four months after suture "she was able to grasp a glass and carry it to her mouth." We must be careful about expressing a bad prognosis because we can get no electrical response in paralyzed muscles.

I regret that this paper has little in it that is original, but if it shall serve to direct the attention of the neurologists, the orthopedists, the surgeons, and the physicians in general of Connecticut to the possibilities of this, the newest advance in surgery, I shall feel that the effort has been worth while.

DISCUSSION.

DR. JOSEPH M. FLINT (New Haven): We are all indebted to Dr. Wells for this very able statement of the present status of our knowledge concerning nerve suture. He has referred to the work of the so-called peripheral school, which interests particularly any surgeon who undertakes nerve anastomosis, because he wishes to know, in the regenerative process, the relative value of the two segments, the peripheral and proximal. Until about twelve months ago, the peripheral school had decidedly the best of the argument. But at that time, Harrison, who is now connected with Yale University, conducted a series of experiments, which seems to show conclusively that the peripheral segment of the nerve is of no use, except as a conducting path from the severed end of the proximal segment to the periphery; that is to say, that the distal portion of the nerve takes no active part in the regenerative process. Harrison removed the neural crest from which

the cells of Schwann originate in young tadpoles. Inasmuch as these cells are supposed to give rise to the peripheral regeneration of axis cylinders, their absence in a developing embryo ought to affect the development of the axis cylinder, if they are in any way essential to its formation. In these mutilated larvæ, naked axis cylinder processes grew out to the periphery, showing that they were solely products of the nerve cells and that the cells of Schwann in no wise contributed to their development.

Harrison has also devised a still more remarkable method of supporting his contention, which is probably one of the most brilliant contributions to the field of experimental morphology since Loeb succeeded in crossing the sea urchin with the starfish. In this recent method, Harrison has succeeded in cultivating tissue isolated from the organism much as we cultivate bacteria. He removes a portion of the neural tube containing nerve cells of a frog larva. This he places in sterile frog lymph, under aseptic conditions. From the nerve cells in tissue so cultivated, axis cylinder processes grow out into the sterile lymph, entirely isolated from the influence of the cells of Schwann, showing that the latter are not essential for either their development or regeneration.

Another point to which Dr. Wells has referred and which seems to me important, is the tendency of certain sensory nerves to regenerate after operation. We know that these nerves, particularly in the so-called peripheral operations for trifacial neuralgia, tend to regenerate, notwithstanding the most violent insults which surgery can devise to destroy them. A consideration of the anatomical relationship of these nerves may offer a suggestion as to the best method of nerve suture to favor regeneration, when that is desired. These nerves run in bony canals. It has been shown that the only sure way of preventing their regeneration is to destroy the continuity of the bony canal in which they run. Some operators have done this by plugging the canals with silver foil; the Mayos use a silver screw, while still other methods have been devised to attain the same results. If, in these cases, this natural tubularization of the nerves is the factor which makes them tend to regenerate, it would seem logical to select one of the methods of suture by tubularization in those cases of injury to nerves where a regeneration is so much desired.

DR. HARRY B. FERRIS (New Haven): Mr. President, Gentlemen of the Connecticut Medical Society: I wish to state that I am fully in accord with what Dr. Flint has said as to the impossibility of longer believing in the peripheral theory. It seems to me the experiments of Dr. Harrison have made it absolutely certain that axons are outgrowths from cell bodies. There is only one point I wish to add to the discussion.

Further experiments were made by Harrison, by cutting certain of the spinal nerves of larval amphibians of about two and one-half centimeters in length, and then watching, under the microscope, from day to day, in the living animal, the changes which occurred. He found that the myelin sheaths degenerate within twenty-four hours and also the axons begin to degenerate, but the process is less marked. At the end of two days in the case of many of the nerves certain protoplasmic bridges form, joining the peripheral and central ends. As soon as this connection is formed the peripheral degeneration of axons ceased. This is evidently a case of primary union of axons with the reestablishment of the conducting pathway and the cessation of further degenerative changes.

The gap between the amphibians and man is considerable, yet it seems to me to open the question as to the possibility, if our technique be sufficiently perfect, of an actual primary union in the case of man, where, for instance, a nerve might have been severed during an operation and immediately united.

DR. ERNEST A. WELLS (Hartford): As in many things surgical, we seem to find exact contradictions when we read from different authors on the same subject. It has been suggested, in this controversy over peripheral regeneration, that the contradiction of results may be explained by lateral anastomoses around the point of section, or by anastomoses with other nerves, thus establishing minute connections with the central nervous system.

As to the recent work of Harrison—I have not seen the original article, only references to it, and I could not form an opinion from these alone. But certainly the operative reports and clinical observations of Murphy and others do make you feel that the matter is perhaps not yet settled. Evidently, I made a mistake in not reviewing Harrison's work more seriously, and I shall hope to see the actual sections when Dr. Harrison returns to New Haven.

In connection with this subject, drawings can be made to illustrate almost anything, and an investigator, unless he be very careful, is very apt to see things one way that another, perhaps, would see differently.

MEDICAL PAPERS

The Etiology and Treatment of Puerperal Infection.

WALTER L. BARBER, M.D., WATERBURY.

Having been requested to write a paper for this meeting on some obstetrical theme, I have selected the above title for the subject as one that would command more interest and surely create more discussion in our Society than any other that I could present.

I must discuss the subject from the point of view of my observation and experience alone, not as a teacher, gifted writer or scientific investigator.

More than one-third of a century of milestones dot the long field of observation. Some of them were danger signals, ever to be remembered, where the disease invaded the home and was tragic in its results. I was taught by that distinguished professor, Fordice Barker, that the fever peculiar to puerperal women was puerperal fever, an essential fever as typhoid is, resulting in unknown blood changes and contagious from undetermined causes, and that local inflammations were not produced by it. The diagnostic signboards were the temperature and pulse. No stress was laid on the nature, mode of entrance, or local result of the unknown poison, or, of course, any attempt at prevention. The theory as to the cause, at that time, was air infection, either epidemic influences, miasmatic, or of sewer gas origin. This was in conformity with the teaching of Dr. Oliver Wendell Holmes, and later Semmelweis, then an assistant in Vienna Lying-in-Hospital, who had published his series of observations in which he said: That the morbid process in the disease was a wound infection, and was due to the introduction of a septic material into the birth canal by the examining finger. That, believing this theory a correct one, he had ordered all persons who came in contact with parturient women to disinfect their hands with chlorine

water, and that as a result the mortality of the disease immediately fell from ten per cent. to about one per cent.

These doctrines, held by Semmelweis and Holmes, were scoffed at and derided by nearly all the prominent obstetricians of their day. It marked, however, as someone has aptly said, "the first gray gleaming of a dawn that obscured then by the clouds of derision and apathy and the mist of imperfect knowledge has gone on to the clear light of a glorious day."

It was not until after the introduction of antiseptics, such as carbolic acid and bichloride of mercury, that the mass of the profession adopted the contagious theory. But, with the appearance of Pasteur's bacteriological work and the recognition of the constant presence of a micro-organism in all fatal cases of puerperal fever, the theory of the bacterial cause was accepted by all, and the solution of a very vexed problem in the cause of puerperal disease settled.

To show the slowness of the process of this antiseptic teaching I might say that in Cazeau's *Midwifery*, an American edition of which was published in 1873, not one word was given respecting the preparations of the patient or physician for labor. Even in 1884, in Lusk's work, absolutely nothing is said in regard to cleaning the parts or washing the hands, but he does add that in a lacerated perineum the blood and clots should be washed away with warm carbolized water. In 1886, Galabin's *Midwifery* says: "Before making any examination, if his hands are cold, he should warm them by washing them in warm water. It is also a good precaution against the conveyance of any septic matter to wash the parts first in soap and water, using a nail brush and then in some antiseptic solution."

So, after more than thirty years of investigation, it has been definitely conceded that the following micro-organisms are the invaders in puerperal infections and can be cultivated from the blood of its victim:

They are the streptococci, staphylococci, gonococci, bacilli colis communis, and gas bacilli. There are others, like the typhoid and diphtheria bacilli, that have been found in the

vaginal secretions, but it is not absolutely proven as yet that they are the cause of the infection that is present. It has also been shown, by bacteriological examination of the uterine lochia of puerperal infection, that bacilli and bacteria are present, whose properties as yet we know but little of; and, like the stars of the heavens, more will probably be discovered which may play a part in the production of rare cases of this disease.

Then there is the infection that arises from the anærobie saprophytes, not easily isolated, but in their growth in the uterus and elsewhere in the genital canal, and which never invade the tissues deeply nor make their way into the blood current, but by their presence in blood clots, bits of membrane and uterine debris produce a toxemia of the system to whose ensemble of symptoms the name of *sapræmia* is given.

It will be seen, then, by this brief recital of the invaders that produce infection, those most commonly found are the pus-organisms about which much is known, and the various putrefactive varieties of which little is known.

What, then, is puerperal infection? We say it is a local or a systematic fever, caused primarily by the presence of pathogenic germs in or on the tissues of the generative canal. After an introduction, these micro-organisms infect by lymphatics, vein or mucuous membrane continuity. The entrance of the germ by the first two channels produces as a rule general infection, while by the last course a more localized condition occurs.

Where does the infection find entrance into the system? The theory of the disease to-day is, that it is a wound infection. The wound necessarily always present is the one caused by the area of placental attachment. Other points of infection are the abrasions and tears along the birth route, generally the cervix, perineum and mucosa. Any pressure from long delay, or instrument causing contusion or necrosis, or the rupturing of a quiescent pus sac, furnish channels of entry for infection.

When does the organism of sepsis reach the wound? Bacteria always resides in the vagina, even in infants a few days

old. But not the pus-forming variety. The gonococci is a familiar exception, often from a too early introduction. It has also been settled, after many years of wrangling, that no pus organisms inhabit the uterus or vagina. This portion of the generative tract is quite free from infection then, preceding labor, as only sterile streptococci are found in the vaginal secretion.

The vulva, however, all bacteriologists claim, is densely populated with pyogenic cocci and sparsely with the colon bacilli, as would be surmised from its proximity to the rectal region. From this fact we can now conclude that infection may arise from contact with these tissues, and be conveyed to sterile localities by any unclean thing, when labor is in progress or after it is ended.

How does the organism of sepsis reach the wound? If, as already has been stated, the vulva and surroundings are always septic, every finger or instrument or article or fabric that comes in contact with the vulval surfaces is liable to convey organisms to the wounded areas, or that which may be, and puerperal infection follow. Every physician who conducts a case of labor, if *not* clean and aseptic in every particular, is transmitting, possibly, a poison to the wound. This dictum applies equally as well to the nurse, and both should never forget their responsibility in this matter to their patient. Should they be in attendance on pus cases, contagious disease, or have on their person any infected cuts or abrasions, they may convey pus-forming germs to their patient and infection result. So, too, can the patient infect herself by inserting her finger into the birth canal, either from partial chloroform anæsthesia or curiosity; by using the old family syringe, every part septic, or by use of unsterilized pads.

Having enumerated some of the direct methods as regards how infection reaches the wound, let us note some of the predisposing conditions. Any protracted labor, where pressure continues too long, a dry birth, any instrumental or operative case, manipulations in the uterus for placenta or membrane, favor abrasions and tears and invite pathogenic germs. The

induction of labor, frequent examination, the retention of labor products in the uterus and clots from bleeding, all prove good media for the development of puerperal infection.

Finally, it is my firm belief that the frequent and too early use of the forceps and the hasty recourse to the extraction of the placenta, are active factors in producing sepsis.

If the etiology of puerperal infection depends alone on bacteriological causes; if, as maintained by obstetricians of mature experience, all childbed infections originate from without the system; if it is correct, and all opinions affirm it, that the streptococci, virulent or non-virulent, are always present in the vulval secretions, then there can exist no doubt of the value of our rules of asepsis for its prevention, and that all treatment of the infection must be along the scientific lines of modern surgery, which, as you know, has banished all pus organisms from our hospitals.

Now, in discussing the treatment of puerperal infection, we find at once that the most important factor is that of prevention. It would seem a simple matter to limit or check the germ invasion by absolutely aseptic methods. It has been accomplished in maternity institutions with perfect technique. Not so, however, in private practice at the homes of the patient, where the bulk of parturient cases must be attended. Here, notwithstanding all our knowledge of the bacteria, their growth and prevention, the mortality is still of appalling frequency. Here in the United States without doubt thousands die every year of this infection, and this death rate will continue to occur if strict aseptic methods are not insisted on and carried out. The fact is, knowing what is right, we go along and neglect these rules for the prevention of this disease. In many instances we are unable to carry them out. The family is not educated up to such requirements; nurses have no training in, or knowledge of, sterilization; poverty compels the husband to employ untrained ones. For the same reason, the midwife is conducting the labor. We shall never stamp out or prevent puerperal infection until the midwife, who attends thirty or forty per cent. of all labor cases, is better taught her

duties. At the present time they are not adequately educated in aseptic methods. They come to the State examination, speaking an unknown language, with an interpreter on each side, and farcically meet the law's requirements; and the shame of it is, that our young men, with six or seven years of continuous study, must compete and work with them. Poor nurses and uneducated midwives are not alone responsible for puerperal infection. The obstetrician must often share the blame. Some of us older men never had any teaching in bacteriology or instruction in asepsis. The theory of the disease had not been discovered. We should acquire correct knowledge in regard to the doctrine. Ignorance is an excuse, but is a disgraceful one, and if we do not possess right views we must learn them. Secure and maintain asepsis for the patient during and after labor. Skill yourself in making examinations and deciding the position of the child from without. Touch the parts as little as you can from within. If compelled to, use sterile rubber gloves. This is the law, not new to us, but, like the Commandments, somehow often broken.

From the position of a man well along in years, I wish I could impress the younger obstetrician with the duty and necessity of waiting. Time is valuable, but not sufficiently so to overcome the objection to hasty and frequent instrumental interference that seems to be rather fashionable at the present day. Forceps are used too often needlessly, I believe. Nature's workings are slow. Why not aid them and accomplish the same end in half the time, especially when it enhances our reputation with the patient and her family, and argues for greater compensation for the operator? This reasoning is bad, and often unprofessional. With any kind of advance in rotation and descent of the head, never employ forceps—most certainly not until cervical dilatation is nearly completed. By such a course tears of the cervix are prevented and the ingress of toxic germs through such channels checked. Do not be afraid to use chloroform in any stage of labor, if the patient's sufferings and efforts indicate its requirements. It may not

shorten labor, but it certainly calms their nerves, lessens their anxiety, relaxes the muscular rigidity, and in every way makes easy their hours of anguish. I have never seen chloroform retard labor, or in any way harm the mother or child. See to it that the uterus is thoroughly emptied of all placenta debris and well contracted; that all perineal wounds, if of any magnitude, are repaired. This at once prevents all hæmorrhage and closes the channels to any invasion of infection. The cause of any temperature of 100° and over must be sought for. It is far safer to consider all such cases due to sepsis and instigate immediate proceedings to neutralize or eradicate it, than to lose time in dallying to overcome constipation, or the diminishing of mammary congestion. A temperature developing within twenty-four hours depends, I believe, as a rule, on some infection within the system autogenetic, primarily of gonorrheal origin. This may occur from a pyosalpinx, vulvo vaginal abscess, or some form of recto vaginal fistula due to the pressure and effort of labor. The cycle of germ development is apparently shorter in these cases, the symptoms of invasion often beginning within twenty-four hours after birth.

To make a correct diagnosis of puerperal diseases, we must obtain and make a culture of the organisms in the uterine lochia just as we secure and examine the Kleb-Loeffler bacilli in making an absolute diagnosis in diphtheria. Professor Williams of the Johns Hopkins University has made easy and feasible such a task, by means of a simple device first introduced by Doderlin. "It consists," he writes, "of a brass tube, twenty to twenty-five centimeters in length and three millimeters in diameter, with a slight bend at one end, so as to conform to the anteflexed condition of the uterus. In taking a culture, after thorough disinfection, the patient is placed in dorsal position, a speculum used, the cervix brought into view with a Volsellum forceps, and, after cleaning, the tube is introduced as far as possible into the uterus. To the end of the tube protruding from the vulva, a large syringe is attached by means of a piece of rubber tubing. Some of the lochia is drawn into the tube, which is then removed and hermetically sealed with wax, and

sent to a bacteriologist for examination. Within thirty hours he can inform you whether the infection is due to pyogenic or putrefactive bacteria, and whether it is liable to be dangerous or harmless." The tube can be sterilized, and carried in the obstetric bag and used when required.

After a temperature rise, say to 101° , it is well to thoroughly explore to find any abrasion or tear of the genital canal, and, if sloughy or unhealthy, it should be mopped with pure carbolic acid. Repeated irrigation of the uterus is inadvisable in the absence of any offensive discharge, but with it the whole birth canal should be irrigated with normal salt solution. Often the fingers give us important information in regard to the diagnosis, and, of course, its treatment. If the uterine canal is rough, irregular and covered with a stringy pultaceous mass which is very offensive, the endometritis is no doubt due to the absorption of putrefactive bacteria, or the infection of colon bacilli. If, on the other hand, the surface of the cavity is smooth, clean and free of odor, or, in other words, little changed, the fever is purely septic, due to streptococci already circulating in the blood.

In the first condition the infection is mild in its action, always local and never dangerous in its outcome. To this form of toxemia most American obstetricians have given the name of *sapræmia*. To that form where the streptococci produce the infection, which is severe in type, often prolonged, never as a rule local, and always dangerous, the term *bacteriæmia* or *septicæmia* is applied.

The curative treatment of these two conditions of puerperal infection to-day are under dispute. Some writers think it ridiculous to make the distinction, claiming that in the early stage we possess absolutely no criterion by which we can differentiate *sapræmia* and *septicæmia*.

This may be so. In fact, it is quite possible that the infection may be mixed—saprophytic and septic. But that should not deter us from an early digital exploration and clearing out of the uterine cavity all of its bad smelling, toxic-producing debris. How this should be done obstetricians do not agree.

I always attempt its removal by my finger, going up back of it to the uterine wall and cleaning the cavity free of its contents. Sometimes it is impossible to reach the fundus. Then a curette is necessary. This is another matter on which there has been much wrangling. Williams objects to the use of it. He says: "In the most severe cases there usually is absolutely nothing in the uterine cavity and its employment can only do harm by breaking down the leucocytic walls, which serve to prevent the invasion of the deeper layers of the uterus by the offending bacteria. On the other hand, when the uterus contains much debris its removal is more readily effected by means of the finger than by the curette."

I have never been able to quite see wherein lay the great danger of injury to the patient of the one method over the other. However, the removal of the toxic material is imperative by some measure. This is followed by a large uterine flushing of salt solution and the fever and symptoms subside in a few days. Where the infection is of streptococcal origin, as indicated by the report of the bacteriologist, or clinically from the condition of the uterus, a douche of sterilized water is all that should be used locally. A few years ago, it was my custom to use a mild solution of bichloride of mercury, and wash out the uterus through a Bozmann's catheter, as a germicide to the part. It was never of any benefit, and there may be some danger of its use by diffusing the infection, or of fatal mercurial poisoning. Besides, the germs have already penetrated the deeper tissues and cannot be reached by the solution. In such cases the bacteriaemic symptoms continue and grow worse; chills, sweating and a prevailing high temperature. The exudates following puerperal infection, as a rule, absorb, and it is a good plan to wait and watch until such a time as you are assured that separation has taken place, then incise and drain the cavity with gauze. If the uterus has become infected by abscess formation, and the process has not extended to neighboring structures, hysterectomy may be useful if done early. But in most cases, infected thrombii have already been carried from the organ before pyæmic symptoms appear and the tissues are too septic for any operation. In such a condi-

tion, where the bacteria are already freely circulating in the blood, the removal of the uterus can only shorten life. In the severe septicæmias, with involvement of the peritoneum, the operation or removal of the uterus has been given up.

Professor Craigan states: "I have operated upon a number of cases of general suppurative peritonitis, the result of puerperal infection, but have never saved a case."

Drainage of the peritoneum is now being tried by abdominal surgeons, who cannot stand by helpless in the presence of such a fatal disease. Last year Leopold published report of nine cases. There were only three deaths, and in all of the fatal cases much loss of time before the operation. "Waiting, hesitation, putting further help in antiphlogistic remedies, may be fatal. Decided early action will be more likely to save the patient." The operation consisted in multiple abdominal incisions, with flushings and drainage. Sir Wm. Sinclair, Professor of Obstetrics and Gynæcology, University of Manchester, writing enthusiastically on this method of treatment, says: "There should be no question on the subject of flushing and drainage. It is a painful exercise of patience to read the pitiful quibbling objection which has been made against the teaching of science and experience and the exercise of practical common sense." For the enlightenment of the surgeons, I quote his procedure: "First stage—(1) The abdominal incision should be only a buttonhole sufficient to pass the largest caliber of Keith's drainage tube, and through this tube should be pushed the glass tube which forms the extremity of the flexible tube conveying the hot saline fluid from the reservoir. (2) The Keith's tube should first be passed into the pelvis and moved gently about so as to get rid of the coarsest peritonitic exudation. (3) The protecting tube should now be moved about all around the abscess cavity, up and down and round about for a long time until there is no suspicion of a speck of lymph or pus in the returning fluid. (4) While the abdomen is full of saline solution, the tube should be withdrawn and the wound quickly closed.

"Second stage—(1) The patient is placed in the lithotomy position and the parts exposed by a wide bladed, weighted

speculum. (2) The uterus is curetted and swabbed and gently tamponed with gauze. It is then gently drawn upward and forward by any suitable volselli. Douglass' space is now open by means of a few snips with a suitable scissors, the opening being just large enough to admit the teat-like glass drainage tube with a wide flange, which is a nostrum with us as yet. (4) During the gush of fluid from the abdomen, this tube is introduced. (5) A final flushing through this vaginal tube will carry away anything possibly noxious contained in the fluid which has flown down into the cavity of the pelvis. (6) The vagina is now packed with gauze, wrung out of corrosive sublimate solution.

"In twenty-four hours or so, the vaginal packing is removed; the pelvis is flushed through the glass tube, the packing of the vagina just under the tube is partly inserted and the gauze tampons is withdrawn from the uterus. The rest of the vaginal packing is inserted but the uterus is not further disturbed. A third flushing through the vaginal tube at the end of another twenty-four hours or forty-eight hours, and the removal of the tube, completes the local treatment."

For general treatment, the disease requires good nursing, which is the most important factor. Medication in this disease, as in other like infections, is of little use. . But food, or drugs, that assist the leucocytes in their fight against the invaders, are especially called for, and of these alcohol and strychnia are the best. The doses should be large, to keep the heart thoroughly stimulated. In some cases, advantage has been derived from intracellular injection, or rectal irrigation of normal salt solution. High temperatures are best controlled by direct application of cold. Antistreptococcic serum has been used, but has been disappointing in real value when we compare it with the worth of antitoxine in diphtheria infection. It can do no harm, however, and may be germicidal to at least one variety of the bacteria. Attempts have been made to loosen the hold of the bacteria in the blood by intravenous injections of silver salts, colligol being the most accepted one used at the present time. I have never used it, but the experience of observers who have, is that it is of no apparent benefit, not unlike the

experimentation with infusion of formalin made by Dr. Greene in 1893. It seems much more rational to follow the toxine and bacteria into the blood stream with mercury, as a germicide, as was done by our forefathers, with often as successful results as we derive to-day.

In conclusion, I would add that the prospects of eliminating puerperal infection from the list of diseases will not be accomplished for a time at least. The problem looks easy after such a *résumé* on its etiology, but it can never be worked out in our time, with our prejudices and habits—no! nor with the mid-wife of to-day, with her lack of knowledge of bacteria and her unclean method of protecting her patient.

DISCUSSION.

DR. O. G. RAMSAY (New Haven): Puerperal infection is always an interesting subject and one on which new material is constantly coming up, and we should feel grateful, I think, to Dr. Barber, for his paper, which reviews the subject so thoroughly and carefully. In the first place, the bacteriology of the vagina is interesting and there are still questions which remain unanswered. It appears, from the work of careful obstetricians, that the upper portion of the vagina in pregnant women does not harbor virulent bacteria, and that the vagina has the power of killing these bacteria if they reach the vaginal vault. It is interesting to theorize as to the reason for this immunity, though we must be satisfied as yet to ascribe it either to the direct action of the vaginal secretions, or to the antagonism of the non-virulent bacteria which normally inhabit this zone. At any rate, we know now that vaginal douches inhibit this antagonism for a greater or less period of time, and for this reason vaginal douches are no longer used after labor.

I was interested in Dr. Barber's statement that he uses with freedom chloroform in any stage of labor. This is not the general practice of obstetricians, as it is claimed to lengthen the period of labor and to increase the liability to post partum hæmorrhage; but coming from a physician of long experience in obstetrics, it may be that there are some cases in which chloroform might be used earlier to advantage.

In regard to the use of the curette in puerperal sepsis, I cannot but feel that Dr. Barber's free use of it may be dangerous. In cases of sapræmia, with retention of more or less large masses of breaking-down tissue, it is probably safe; but we are rarely able to be sure that we are in the presence of a case of sapræmia and not septicæmia, and in this last group the uterus should not be curetted, as the curette breaks down the guarding wall of leucocytes and opens up the

lymphatics. I am sure, in this connection, that most of you have seen cases of infection either after abortion, or full term labor, in which after curetting there was a chill, a sudden rise of temperature and many times death, and I feel quite sure that this unhappy result often follows the too zealous use of the uterine curette.

DR. RICHARD F. RAND (New Haven): I just want to bring before the society the fact that the use of ether in obstetrics is exceedingly valuable in many cases, even for the partial anæsthesia for which we are so inclined to use chloroform.

Immediately after the discovery of ether, Dr. Walter Channing of Boston published, in 1848, a report of some five hundred cases of obstetrics for which ether was used for anæsthesia, with excellent results. Of late I have been using ether, by the drop method, for partial anæsthesia during the second stage of labor, with very great satisfaction. With it one has a feeling of far greater safety than with chloroform, especially when it is necessary to entrust the anæsthesia to the hands of an untrained person. I use a dropping bottle that has been choked so that it will deliver drops only, and a chloroform mask, with a few layers of gauze on it. You can obtain in this simple way an anæsthesia which permits the control of the head during labor, and relieves the pain to the mother; and you feel pretty certain you are not going to have a post partum hæmorrhage from chloroform, and not going to have a sudden collapse of the patient from an overdose of chloroform.

DR. EDWARD W. GOODENOUGH (Waterbury): In a general practice, especially among the poor and ignorant, it is impossible to prevent a small percentage of infection. With mothers, untrained nurses and midwives for assistance, there is no asepsis; even antiseptics cannot take the place of cleanliness, cannot overcome filthy quilts and no bed linen. We can, however, be sure that *we* do not bring the infection.

I have had four hundred cases of confinement, with two deaths, one directly the result of infection, the other indirectly.

My third labor case (now nearly fourteen years ago) died five weeks after the birth of her baby. Some time later I treated her husband for, as he acknowledged, a second attack of gonorrhœal epididymitis. The baby had sore eyes. Because of this infection, the subinvolved uterus was soft and easily penetrated. I had a fancy irrigator—the best, so the instrument salesman said—and I used a 1-2000 bichlorid solution through it. The uterine wall was penetrated and the strong solution poured into the general abdominal cavity. The damage was done and death resulted in twenty-four hours. I was not responsible for the infection—her husband was; but she died.

Six years ago I lost my second case—a primipara—a fairly easy labor, with a perineal tear of the first degree. My hands were washed

in soap and water and scrubbed in lysol solution. She died on the eighth day of puerperal septicæmia. She had a trained nurse, able consultant advice, everything possible at the end, when too late. Her pads were made out of old quilts, against my direction, and she had only her mother at first to care for her—a woman who had no experience. Her husband's second wife had also a severe infection at childbirth, under another physician, and there may have been a causal relation here, the father to blame for both cases. But the infection was, with one exception, the most virulent I had ever seen, and in looking back to see if by any means I could have furnished the poison, I remembered that I had, with my uncovered thumb and forefinger, removed a dead end phalanx from a rotten finger the day before. This, I believe, was the source of the infection. I have had all kinds of difficult labors and obstetric accidents, but these are the only deaths which in my own practice could be either directly or indirectly traced to childbearing.

Now I always carry Harrington's solution with me; always use it, when there is any possible question of transmission from my hands or arms of virulent bacteria, and always wear sterile rubber gloves.

It is because I have always prided myself on my cleanliness in such cases that I quote these examples. We cannot take too good care of our mothers.

DR. WALTER L. BARBER (Waterbury): In regard to chloroform, I can only say I give my patients chloroform at the latter end of the first stage, and virtually go to bed with them if they pay me for it, and I continue it and I never have seen any trouble. Of course I know it is written that you should only give it in the third stage. I would not like to use the drop method of ether, of dropping ether for six or eight hours, certainly not.

I am very glad that Dr. Goodenough has reformed in regard to giving 1 to 2,000 of bichlorid into the uterus. I am also very glad he is using, if he is going to use that method, a proper instrument, and is wearing rubber gloves.

In regard to serious septicæmic cases, I believe that the time is coming, which is the gist of my paper and which I did not have time to read, that in these— What are you going to do, gentlemen, with a bad case of peritonitis, temperature 104, and a failing pulse, and perhaps vomiting green matter? I believe the time is coming when we will make an abdominal incision and flush out the abdomen, and then incise the pouch of Douglas and flush that out. I believe that will be one of the chief things we shall do.

I did not have time to quote a paper on this subject that had been written, and very thoroughly criticized by Sir William Sinclair, but I certainly agree with him that a few years from now we shall make no distinction between sapræmic and septicæmic cocci, and that early in bad cases this method will be the operation.

Some Observations on Grocco's Sign.

GEORGE BLUMER, M.D., NEW HAVEN.

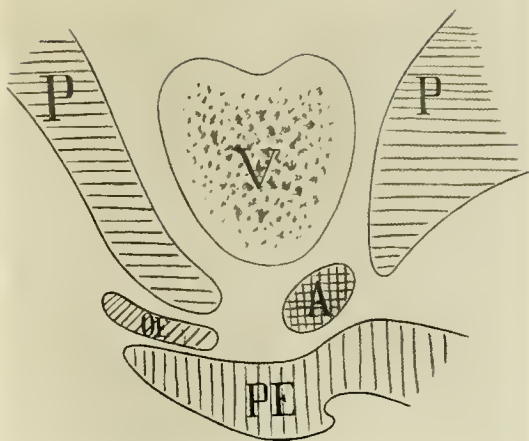
The difficulty, in some patients, of diagnosing the presence of free fluid in the pleural cavity, is so well known that it need only be mentioned to recall to the mind of the practitioner cases of this sort. Whilst in the average case a careful observer can usually decide with reasonable certainty on the presence or absence of pleural effusion, there remains a fair percentage of patients, especially children, in whom the usual symptoms may be absent and the physical signs masked or atypical. In any case, as Ewart has pointed out, at least one-fifth of the pleural sac must be filled before the ordinary signs of effusion are distinct, and collections of fluid filling less than one-fifth of the cavity are diagnosed with considerable difficulty. A new sign of free fluid in the pleural cavity which is reasonably constant, and is simple in its technique, should therefore be a welcome addition to our diagnostic armamentarium.

The sign which is usually described in the literature as Grocco's sign was probably known to Rauchfuss of St. Petersburg for many years, though his publications on the subject did not appear until two years after Grocco's paper. In an article published a month after Grocco's contribution, Koranyi of Buda-Pesth makes it evident, both by his diagram and his text, that he had observed the sign, but he does not call special attention to it and merely discusses it incidentally in a paper on auscultatory percussion. The credit of insisting upon its importance, if not of its discovery, undoubtedly belongs to the Italian observer. Since Grocco's paper appeared, early in 1902, there has been abundant confirmation of his observations, and though a few have disagreed with them, and wider experience has shown that lesions other than pleural effusion occa-

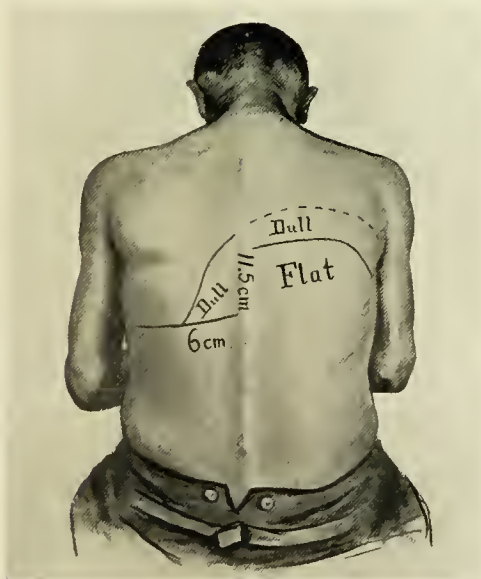
sionally produce the sign, the mass of opinion favors the view that the phenomenon is one of definite and decided clinical value. Most of the contributions regarding the subject have come from Italian observers, but Hamburger and Pollak in Austria, Bernard and Muguet in France, Ewart, Forbes-Ross, Morison, and Smith in England, and Thayer and Fabyan, Frankenheimer, and Calvert in this country, have all published valuable contributions to the subject.

Grocco's sign is a *paravertebral triangle of dullness which appears on the sound side in cases of pleural effusion* in which the fluid is free in the pleural cavity, or, if encapsulated, is in contact with the vertebral column. It is necessary to point out that the dullness, whilst usually well defined, is only relative, and that it is most marked near the spinal column and becomes less intense as the percussor recedes from that structure. One side of the triangle corresponds to the middle line of the body over the vertebral spines. The second side is formed by a line corresponding to the base of the sound lung, and the third side roughly corresponds to a line joining the apex of the vertical side with the outer extremity of the horizontal one, though this line is often convex outwards rather than straight.

The size of the triangle varies, within certain limits, with the amount of the effusion, and is usually larger in right sided effusions [left sided triangles] than in left sided ones. All sides of the triangle are not, however, equally variable, for the base, which may be from two to nine centimeters long, varies much less than do the two other sides. The apex is, according to Ewart, at the level of the upper margin of dullness on the affected side, but most observers state that it is generally one or two spines, and at times three or four spines, below this point, and this has been my experience. This point corresponds, according to most observers, rather to the upper level of flatness than to the upper level of dullness. Then again, the condition of the underlying lung is of importance in determining the size of the triangle, for as Frankenheimer has pointed out, a small effusion overlying a consolidated lung can



Showing the relation of the pleural cavities (P) to the vertebral column (V), the œsophagus (œ), aorta (a) and pericardium (Pe). (After W. J. Calvert.)



GROCCO'S SIGN.
(After Thayer and Fabyan.)

produce as large a paravertebral triangle as a larger effusion overlying a normal lung. I have been able to substantiate this observation in several cases of metapneumonic pleurisy. The triangle also changes in size with changes in the position of the patient. It is best observed with the subject in the sitting or standing position. With the patient lying on the affected side it will, in small effusions, disappear within a few minutes; in larger ones it will decrease in size. In the case of bilateral effusions two triangles may be observed, and inasmuch as the two effusions are seldom equal in amount, the triangles are not symmetrical.

The percussion technique necessary to demonstrate the triangle is simple enough, and consists in first finding the level of dullness over the spinal column, then marking by a horizontal line the base level of the sound lung, and finally by percussing along a series of imaginary vertical lines parallel to the spine and a second horizontal series at right angles to it, delimiting the hypotenuse of the triangle.

The changes which occur over the paravertebral area of dullness do not, however, concern the percussion alone, for auscultation furnishes valuable confirmatory signs. The breath sounds are, in my experience, usually decidedly feebler over the triangle than over the rest of the sound lung, and at times the breathing may have a distinctly tubular quality. This I have observed once in a patient with a very large effusion and once in a patient with a metapneumonic pleurisy. I have heard rales over the triangle but once in thirteen cases observed during the last year, and other observers have noted them as occurring occasionally. The most striking auscultatory change over the triangle is the nasal character of the voice sounds. This was present in a great majority of patients observed by me, and was in some instances most marked near the apex of the triangle. In one case the nasal voice sound was transmitted beyond the triangle towards the scapula, a circumstance which might possibly be explained by transmission through enlarged mediastinal glands in this situation. I have never been able to detect over the triangle the ringing

coin sound which one hears over a pneumothorax, though several writers state that the coin sound may be present over the Grocco triangle.

Since Grocco's paper first appeared a good deal of study has been devoted to the explanation of the triangle. Grocco endeavored to study it by means of the X-ray, but the post-mortem studies made by Baudel and Siciliano, G. Elliott Smith, and Calvert have been much more satisfactory. From an anatomical standpoint these studies indicate that a revision of current ideas regarding the relation of the pleural sacs to the spinal column is needed. Both pleural sacs lie in contact with the vertebræ, but the right pleura regularly passes further in front of the bodies of the vertebræ than the left, and not infrequently extends beyond the median line. With fluid in the pleura the distended sac may reach in front of the vertebræ well beyond its normal situation, and in the case of a distended right pleural cavity, as in the case reported by G. Elliot Smith, it may even project into the left side of the chest. Furthermore, this distention of the pleural sacs is accompanied by a lateral displacement of the heart and the contents of the posterior mediastinum, naturally more marked when the right pleural cavity is distended. Bearing these facts in mind, several explanations for the dullness suggest themselves. Theoretically, it might be directly due to the displaced mediastinal tissues, or to the distended pleura, or indirectly to some effect of the accumulated fluid. The majority of authors do not believe that the displaced mediastinal tissues can in most instances cause the triangle of dullness, though Frankenheimer suggests that the outward convexity of the hypothernuse may be due to them; neither is it generally believed that the dullness can be due to a displacement of the distended pleura itself to the opposite side of the vertebral column. There is evidence that this may actually occur with very large right sided effusions, but it is certainly exceptional. The generally accepted view is that the fluid, coming into contact with the vertebral column, damps the normal resonance of this structure and that of the adjacent ribs on the sound side. As

Ewart puts it, "The spine and the ribs act as a pleximeter, conveying to the surface the muffled character imparted to the percussion vibrations by a distant contact with fluids." "Metaphorically speaking," says the same author, "the dulled spine casts its shadow into the resonant chest." On the theory that this explanation of the dullness is correct, as it probably is, Morison proposes calling it "parachumatic" percussion dullness, the word parachumatic meaning near an effusion.

None of these explanations make it clear why the area of dullness should be a triangle. Several reasons are advanced by Forbes-Ross and Ewart for this. It is pointed out that the bodies of the dorsal vertebræ increase in size from above downward, that the paravertebral groove opposite the base of the lungs is wider and deeper, and contains more muscle than it does higher up, and that the costovertebral cavum is larger and contains more fluid at the base of the lungs. For these reasons the damping or muffling effect is greatest opposite the bases and diminishes as the apices are approached. The fact that the ends of the eleventh and twelfth ribs are free and do not vibrate in consonance with the chest wall also probably increases the area of dullness at the base.

Having shown that the paravertebral triangle of dullness is almost constantly present in pleural effusions, it is necessary to ask whether conditions other than fluid in the pleural cavities can produce the triangle. It is now admitted that certain abdominal conditions can do this. Ewart has shown that in ascites, where a good deal of fluid is present, bilateral symmetrical triangles are present which, however, are broader at the base and relatively much shorter than those seen in pleuritic disease, and differ also from the two triangles seen in double pleuritic effusion by their symmetry. Alexander Morison suggested that collections of pus beneath the diaphragm would probably produce paravertebral triangles, and this suspicion has been confirmed by Ewart and Beall. Smithies has shown that cystic abdominal tumors can also produce a Grocco's sign. In all these instances, however, the accompanying symptoms and signs of intra-abdominal disease would probably in most cases

allow the observer to differentiate the condition from pleural effusion. It has been claimed by some, Pollak especially, that the sign can also be present in lobar pneumonia; but most observers, whilst agreeing that a paravertebral dullness may occur in this disease, claim that unless effusion is also present the dullness does not take the form of a triangle, but occurs as an ill-defined band parallel to the spinal column. One must conclude, we think, after a critical survey of the facts at hand, that paravertebral dullness, when distinctly triangular in shape, is fairly distinctive of pleural effusion when associated with signs of intrathoracic disease. It also seems certain that it is of distinct value in the recognition of small effusions and of encapsulated effusions, providing that these are in contact with the spinal column. When the triangle does occur as a result of disease below the diaphragm, it is usually symmetrical, differs in shape from the typical triangle of pleural effusion, and should usually be distinguished without trouble on this account, and on account of the presence of symptoms pointing to intra-abdominal disease.

BIBLIOGRAPHY.

- Thayer and Fabyan. *Amer. Jour. Med. Sci.* January, 1907. (This article contains the important literature up to 1906.)
 Pollak. *Wiener Klin. Woch.* 1906, xix, 1192.
 Hamburger. *Wiener Klin. Woch.* 1906, xix, 402.
 Durante. *La Pediatria.* 1906, 2s, iv, 678.
 Rauchfuss. *Deutsch. Arch. f. Klin. Med.* 1906, lxxxix, H. I.
 Forbes-Ross. *Lancet.* 1907, i, 1773.
 Ewart. *Lancet.* 1907, ii, 49.
 Morison. *Lancet.* 1907, ii, 112.
 Smith, G. Elliot. *Lancet.* 1907, ii, 890.
 Frankenheimer. *California State Jour. of Med.* September, 1907.
 Calvert. *Amer. Jour. Med. Sci.* October, 1907.
 Beall. *The Jour. of the Amer. Med. Assn.* December 28, 1907.
 Smithies. *The Jour. of the Amer. Med. Assn.* May 9, 1908.

DISCUSSION.

DR. WALTER R. STEINER (Hartford): I think Dr. Blumer has well emphasized the fact that Grocco's sign is not absolutely pathognomonic of pleurisy with effusion, yet it is, in truth, of great assistance often,

as one of the aids to differentiate a pleurisy with effusion from a pulmonary consolidation, a mediastinal growth or other conditions occasionally confused with it. We must remember, however, if we use it, that Ewart has found it in cases of ascites, Beall in one of a subphrenic abscess and more recently Smithies in a case of multilocular cyst-adenoma. We should, also, remember that this sign may be absent, even in pleural effusions which have been later diagnosed only upon aspiration (as evinced by some recent unpublished cases at Bellevue Hospital). This is also seen in the latest communication from Grocco's clinic in Florence, where two cases are detailed of repeated attacks of pneumonia and pleurisy, in elderly men. The explanation there given is that the pleura was probably fastened by adhesions.

With all its limitations, though, Grocco's sign has been used with good effect by such well-known clinicians as Ewart in England and Thayer in this country. I became acquainted with the sign soon after its publication in 1902, and, stimulated by the good reports from its use by Ewart, Thayer and Fabian, Reilly, Rauchfuss, Frankheimer and others, I have often found it of assistance. For example, it has been of service in the following three cases, recently observed at the Hartford Hospital, on the service of Dr. F. T. Simpson.

The first case was one of right lobar pneumonia, which was indeed very slow in resolving. We never could obtain Grocco's sign, aspiration was negative and the process was slowly clearing up when the patient, growing restless under hospital restraint, was taken by her husband to her home in a neighboring city. I have been unable to trace her after she left the hospital, but the absence of Grocco's sign, with the other indications the case yielded, has led me to think the condition was one of lobar pneumonia, of slow resolution.

The second case was one of great interest to me, as it showed a resemblance to one in Thayer's series. It was an interlobular empyæma which did not perforate into the pleural cavity, but was finally operated on and the pus evacuated. The absence of this sign, the negative results from aspiration and the subsequent history of the patient, all yielded confirmatory results. The sign, of course, was absent because the purulent fluid did not reach the spine.

The third case was one of lobar pneumonia in a girl, aged six years. The breath sounds were at first suppressed in the affected area—the left lower lobe—but Grocco's sign was absent, so we thought the condition might be one of beginning pneumonia. This proved to be the true condition of affairs. The temperature fell to normal, by lysis, in seven days, but after a week showed some fluctuations and an empyæma developed, which came to operation. Unfortunately I was unable to watch the child after her pneumonia subsided, so I do not know whether she gave Grocco's sign when the empyæma developed. It is probable, of course, that she did, for purulent fluids yield this sign

with but the following exception, noted by Vignola. The case was one of pleurisy with effusion, which exhibited this sign until the fluid became purulent. Reilly thinks if a relatively large triangle is present, in a small effusion, we are almost certainly dealing with a purulent effusion. I do not know of other observations to bear out this statement.

My experience with the sign has accorded with that of other observers, concerning the apex of the triangle beginning below the line of dullness. It is generally found at or slightly above the line of flatness. The triangle on the left side has been larger than on the right, and the size of the triangle has varied with the amount of fluid present. The disappearance of the triangle, when the patient lies on the affected side, is an important point, to be looked for in every case. If there is, however, a large amount of fluid, or the effusion is encapsulated, or a small amount of fluid is present on the apparently unaffected side, then the triangle will not disappear, though the patient be on the affected side. It seems to me that the sign is peculiarly valuable in cases of pleurisy with effusion in children, because here the indications of the presence of fluid are so frequently misleading.

DR. WILLIAM G. DAGGETT (New Haven): In a normal chest, percussion over the area in which Grocco's sign may, under abnormal conditions, be found, gives rise to sound waves which spread radially from the point percussed. The vibrations are produced in a chamber or cavity partly filled with lung tissue, bounded on one side by the skin and subjacent muscular structures, on another by the diaphragm, on a third side by the bodies of the vertebræ, which are to a certain degree resonant, and by the mediastinal pleura, and bounded in all other directions by normal lung tissue. When an effusion, which, for our purpose, we will designate as considerable though not massive, exists on the opposite side, the only appreciable change in conditions on the sound side is that effected by the pressure of the pleural sac, partly filled with fluid, upon the bodies of the vertebræ and the mediastinal pleura. We thus have one side of our resonant chamber muted, and this muting of one side must, of necessity, bring about an alteration in the percussion note, because the excursion of the sound waves in the direction of the diseased side is abruptly interfered with. This is the explanation of the relatively dull note. To explain the triangular shape of the dulled area we must remember two facts: first, that the bodies of the vertebræ increase in size as we proceed from above downward; and, secondly, that the effusion is most abundant at the lowest portion of the pleural cavity. Thus the damping effect of the effusion will be greatest over the bodies of the eleventh and twelfth vertebræ, and this effect will extend laterally a greater distance in a line parallel with the diaphragm, shading off gradually in a vertical direction, until it is lost entirely at or near the upper level of the effusion.

In the instances of ascitic or other collections of fluid in the abdominal cavity, where the sign is evident it is noted that the triangle is lower and possesses a longer base line than in pleurisy. The explanation of this lies in the fact that an abdominal effusion would more completely cover the vertebral bodies and therefore more effectively mute them, giving a broader area of impaired resonance, and, because fewer vertebral bodies are affected than in pleurisy, a diminished height to the triangle is a natural result.

Theories which suggest the displacement of the mediastinal contents, or the invasion of the opposite side of the thoracic cavity by the affected pleural sac, as explaining the dullness, are not considered tenable. Nor are the phenomena under discussion analogous to the dullness described by Pins and Ewart, as found over certain regions of the posterior aspect of the left chest, in extensive pericardial effusion, because, in a moderate pleural effusion, there is not any considerable displacement of the contents of the healthy side, and in pericardial effusion the left lung is markedly displaced.

The Bearing of Recent Investigations on the Treatment of Typhoid and its Complications.

CHARLES J. FOOTE, M.D., NEW HAVEN.

Much work has been done in the past few years on the chemistry of foods, on the physiological effects of alcohol, and on intestinal antisepsis. I wish to discuss the bearing of this work on the milk diet, on the use of alcohol, and on intestinal antisepsis in typhoid fever.

Milk as a sole article of diet for the adult, either in health or disease, is a physiological incongruity. For a complete diet, milk contains too little proteid, and far too little carbohydrate. It contains fat only in about sufficient quantity to supply the needs of the body. The father of Greek medicine, though ignorant of calories and the chemistry of foods, sounded the correct note when he said, "It is a bad thing to give milk to persons having a headache, it is also bad to give it in fevers and to persons whose hypochondria are swelled up and troubled with borborygmi, and to thirsty persons and to those who have copious discharges of blood." Is it not possible that he had in mind the headache, tympanites, gurgling in the right iliac fossa and intestinal hæmorrhage of typhoid fever.

What the rationale of the milk diet is, it is hard to understand. Its use in typhoid is based more on expediency than reason. It is easy for the doctor to order; few explanations are needed. It is easy for the nurse to prepare. No cooking is necessary. Thus it is a favorite diet with nurses.

Some eighteen years ago Rachford¹ showed that cultures of the *B. typhosus* grown in milk were much less toxic than those grown in certain beef extracts, and from this inferred that there was much less danger of toxæmia on a milk diet.

¹ *Medical News*, October 26, 1889.

This is the only reason why it should be prescribed. The disadvantages of using it as a sole article of diet are many. It often forms a thick tough curd in the stomach which is hard to digest. The only ingredient that it contains in available proportions is fat. To supply the average man with enough proteid we would have to give him three quarts of milk daily, but in so doing we would overload his stomach with fat, and even then supply him with insufficient carbohydrate. The amount of proteid needed by a man in health has been fairly well determined, but in typhoid fever the amount has not been worked out so accurately. The nitrogen eliminated in the urine is our chief guide, and of this we find almost invariably a marked increase in typhoid fever. This increase continues throughout the febrile period, and is sometimes nearly double the physiological amount, and sometimes even more than this. Recent investigations of Ewing² on nitrogen elimination in typhoid fever show a daily excretion on the thirteenth day of the disease of twenty-seven and forty one-hundredths grammes, but the average amount to be under twenty grammes.

In health the amount is from ten to fifteen grammes. If an amount of proteid equivalent to the amount of nitrogen eliminated is not taken in the food, there is presumably a consumption of tissue proteid and a loss of nitrogen. This shows itself in rapid emaciation and muscular weakness. To supply eighteen to twenty grammes of nitrogen on a milk diet the patient should take approximately four quarts of milk daily. Very few patients will take this amount, or even half of it, so the nitrogen must be supplied in other ways. Numberless foods have been put upon the market to meet this need, and a few of them are not without value. The nitrogen can be supplied to a large extent by adding egg-nog to the diet, and by giving beef juice and scraped beef. It is well in feeding typhoids to give nothing that cannot be passed through a fairly coarse sieve, and to follow all meat preparations with hydrochloric acid and pepsin.

² *Journal of the American Medical Association*, Vol. 48, p. 1056.

Carbohydrate in the milk amounts to about forty grammes to the quart. This is in the form of lactose. A healthy man at rest consumes about five hundred grammes of carbohydrate. There is no accurate estimate of the amount consumed in typhoid fever, but we cannot be far wrong in assuming it to be about as much as in health.

To get this amount from milk the patient would have to drink approximately twelve quarts; we must therefore supply it in other ways. Recent investigations attach great importance to carbohydrates in the diet in infectious diseases, for carbohydrates are glycogen feeders, and glycogen is regarded more and more as the dynamic element in the heart beat and in muscular action. This most valuable substance disappears from the liver in fever, and when nothing is given in the food to replace it, the result must necessarily be a general weakening of the system, including the heart muscle.

Jensen³ has shown that the muscular fibers of the heart maintain their store of glycogen during starvation longer than the skeletal muscles. It seems likely that the muscular fibers of the heart depend to a great extent on glycogen for their nutrition and liberation of energy, hence glycogen has been given to typhoid patients with asserted excellent results.⁴ Other investigations indicate that glycogen increases the resistance of the tissues to bacterial invasion. Thus Colla found that by feeding rabbits glucose, so as to increase the amount of glycogen in the liver and muscles, he increased their power of resistance to infection. But we need carbohydrate in the food, not only to supply glycogen but also to protect the proteids of the tissues. Experiments on rabbits during fever show that the administration of carbohydrates reduces proteid destruction to or even below the normal amount.⁵ It is probable, therefore, that carbohydrates furnish a food to the heart muscle, protect the proteids of the tissue from destructive metabolism, and may be a factor in combating infection.

³ *American Year Book of Medicine*, 1903, p. 568.

⁴ *American Year Book of Medicine*, 1904, p. 487.

⁵ Van Noorden. *Metabolism and Practical Medicine*, Vol. ii, p. 135.

Milk as a diet supplies very little available carbohydrate. This is in the form of lactose, the carbohydrate that the body finds most difficult to convert into glycogen. To supply this lack of carbohydrate in milk, the patient must take additional carbohydrate in easily absorbable form, wheat, oatmeal or arrow root gruels, barley water, flour ball, rice boiled to a pulp, racahout, etc. With these should be given some diastatic ferment, such as takadiastase, or holadin. The ideal way to give the carbohydrate is in some converted form almost ready for absorption, such as maltose and dextrose. This may be accomplished by using some malt food or flour ball. There is no question about the ability of most typhoids to digest and absorb carbohydrates, if given in a palatable form. If given aright they should pass into the circulation quickly and leave no residue to cause any intestinal disturbance. I have treated several hundred cases of typhoid with a rigid milk diet and have had a mortality of about eleven per cent. I have had a considerable number die of apparently nothing else than heart failure, the heart lapsing into the condition known as delirium cordis. Many of the patients who have recovered have been much emaciated and have suffered from a slow, tedious convalescence. A patient on a milk diet is really in a half-starved condition, and is a prey to secondary infections which still further delay his recovery, such as furunculosis. It seems to me that the heart conditions, the emaciation and the slow convalescence, might have been avoided by a more liberal diet. Statistics are gradually accumulating whereby we can compare the mortality on a milk diet with the mortality on a more liberal diet. Thus the statistics of Shattuck⁶ give a mortality of ten per cent. on a milk diet to eight and forty-five one hundredths per cent. on an enlarged diet.

Another food of use at times in typhoid is alcohol. I refer to it as a food because it is classified as such by physiologists. Fully ninety-eight per cent. of the alcohol taken into the system is burned in the body and the energy therefrom utilized. Only about two per cent. is eliminated unchanged.

⁶ *Boston Medical and Surgical Journal*, Vol. cxlviii, p. 151.

But when we try to find the indications for the use of it, we get most conflicting answers. I have been accustomed to regard the pulse as almost the sole indication for the use of alcohol in typhoid fever. When the pulse begins to rise to 110 I have been in the habit of prescribing whiskey, though I have treated many cases without using it at all.

Let me quote a few authorities on the use of it.

OSLER: Alcohol is not necessary in all cases but may be given when weakness is marked, fever high and pulse failing. When the heart beat is feeble and the first sound becomes obscure, if there is muttering delirium, subsultus tendinum and dry tongue, brandy or whiskey should be freely given.

CURSCHMANN: Alcohol is indispensable—in children it is to be avoided altogether or to be employed only temporarily as a last resort. In severe cases in adults I permit from the outset small quantities of spirituous drinks to be taken regularly, diluted or undiluted, keeping in mind the constitution and previous habits of the patient, gradually increasing the amount with the rise of the fever.⁷

HUTCHINSON: Alcohol should be reserved until the action of the heart grows feeble and the first sound becomes indistinct.⁸

HENRY: The previous habits and age of the patients are the chief factors in determining whether alcohol is to be given or not. Most persons under thirty years of age, previously temperate, if placed under proper treatment during the first week will do better without alcohol. The previously intemperate require decided doses of alcohol from the start, which must be increased as the disease progresses. Patients over forty years of age, of previously temperate habits, will generally be benefited by a moderate amount of wine or whiskey during the entire course of the disease. In all cases attended with marked nervous symptoms, such as low muttering delirium subsultus tendinum, and restlessness, alcohol should be tentatively prescribed.⁹ No rule universally applicable can be formulated with reference to the administration of alcohol in typhoid fever.⁹

Wood and Fitz¹⁰ in their practice of medicine hardly refer to it under the treatment of typhoid fever, except to recommend it where there is pulmonic congestion, the outcome of

⁷ Nothnagel. *Typhoid and Typhus Fevers*, p. 450.

⁸ *Pepper System of Medicine*, Vol. i, p. 324.

⁹ *Hare's System of Therapeutics*, Vol. ii, p. 312.

¹⁰ *The Practice of Medicine*, p. 145.

cardiac or vaso motor weakness. These writers, then, think it indicated in the following conditions:

1. High fever and failing pulse,
2. in patients over forty years of age,
3. in alcoholic cases from the start,
4. in patients with severe nervous symptoms—subsultus,
etc.,
5. in patients with pulmonic congestion.

It is contra-indicated in children and in patients under thirty years of age of temperate habits. Let us now consider the teaching of recent investigators on the use of alcohol. I have already referred to alcohol as a food. Atwater and Benedict^{10a} have not only shown that alcohol is burned up in the body, but also that it can replace equivalent quantities of carbohydrate or fats if the supply of either of these is insufficient. If it is added to a diet that is sufficient the fat or carbohydrate are stored. It is this power of protecting from oxidation, or replacing fats and carbohydrates, that gives it its value in typhoid fever. On a milk diet the carbohydrates are much below what they should be, but typhoid patients on a milk diet do not have the mortality that we might expect from such a diet, because whiskey is usually given them and this replaces the fats and carbohydrates of the food.

Here, then, is a clear indication for the use of alcohol. If for any reason fats and carbohydrates cannot be digested and absorbed with sufficient rapidity, alcohol meets the need. When there is loss of flesh and emaciation, due to insufficient supplies of fat and carbohydrate, alcohol is indicated. It is a fine question in what dose alcohol ceases to be a food and becomes a poison, in what dose the depressing effects counter-balance the nutritive effects. The dose must vary with different individuals, but I think that larger quantities are often-times given than are beneficial. If in typhoid fever we do not

^{10a} *Memoirs of the National Academy of Sciences*, Vol. viii.

get the benefit we expect from twelve ounces of whiskey in twenty-four hours, it is always useless and often harmful to press it still farther.

The testimony of recent investigations regarding the effect of alcohol on the circulation is conflicting, but the weight of testimony favors the idea that it is a heart depressant in large doses. Binz, Wood, Backman and others have experimented with alcohol on the excised hearts of reptiles and mammals.

Backman¹¹ experimented with a mammalian heart. He established an artificial circulation, and passed through the vessels of the heart first a solution of alcohol (.0025 to .5 per cent.). Later he followed the alcohol by solutions of grape sugar. He found that the alcohol produced a temporary irregularity of pulsation, or a brief diminution of the strength of contraction, or even a lasting arrhythmia, and a considerable reduction in volume and number of pulsations. When the alcohol was replaced by solutions of grape sugar (.5 per cent.) there was a distinct restitution of the work of the heart, showing that the heart had not been overworked, but still possessed power of making use of nutritive substances furnished it. These experiments agree with those of Locke, who found that grape and fruit sugar caused a gradual augmentation of the contractions of the isolated heart.

Let us turn now to experiments on man. Cabot¹² made 1000 observations on patients, mostly typhoid, at the Massachusetts General Hospital, during and after the administration of alcohol, in varying doses, and could not detect any change in blood pressure, neither was the temperature, pulse or respiration affected by it. He concluded that the action of alcohol on the circulation was nil.

A quotation from Cushny states the present position of most pharmacologists on the effects of alcohol on the circulation. "In small doses alcohol does not affect the heart. In large doses it is a cardiac depressant. In man it produces no change in rate or alteration in area of cardiac dullness. It produces

¹¹ *Journal of the American Medical Association*, Vol. xlix, p. 458.

¹² *Boston Medical and Surgical Journal*, July 23, 1903.

dilatation of the superficial vessels, and very large quantities reduce blood pressure.”¹³

The clinician has abundant opportunity to study the effects of alcohol on man. The patient who, after a night's drunk, comes into the hospital to sober up, shows us the effects of large doses of alcohol. He usually has rather a weak, rapid pulse, with little back of it, a heavily coated tongue, and nausea. The effect of the alcohol on his circulation has been that of a heart depressant, and in inordinate doses it unquestionably acts in this way. But given in medicinal doses, half an ounce every three or four hours, as it is frequently given in typhoid fever, I have never been able to see any depressing effect on the circulation. On the other hand, I can agree with the conclusions of Cabot. I have never been able to satisfy myself that alcohol in typhoid is necessary as a heart stimulant. The heart muscle in typhoid does not need a stimulus to increase its force for a short time, but needs improved nutrition. Some writers claim that the value of alcohol is not so much as a heart stimulant as a vaso dilator of the superficial vessels of the skin, and claim especial value for it in cases where there is a determination of blood to the viscera. On this theory it is given in cases of threatened hæmorrhage or perforation.

Alcohol is much used in cases of typhoid attended with marked nervous symptoms, such as low muttering delirium, subsultus, etc. Theoretically it might be used in such cases for the quieting effect claimed for it. Schmiedeberg states that alcohol depresses the higher nerve centers by which a degree of narcosis and lack of concern is produced. Cushny also speaks of the narcotic effects of alcohol. In restless and active delirium it might possibly quiet, but we rarely see this kind of delirium in typhoid. In spite of this alleged narcotic effect on the system, I have failed even to see in medicinal doses any markedly hypnotic or sedative effect, and should hesitate much before giving a typhoid patient large enough doses to produce a narcotic effect. The use of a pint of whiskey every day for

¹³ *Boston Medical and Surgical Journal*, Vol. cxvii, p. 34.

eleven days, a method used by Meltzer¹⁴ in typhoid, I cannot approve. Aside from the injury it does the stomach, and from the depressing effects that it has on the heart, it interferes with the giving of a proper amount of nourishment and other needed medicine. It retards convalescence, for when it is cut off it lets the patient down.

In considering the effects of alcohol on the stomach, it is necessary to discriminate between large and small doses. Large doses on an empty stomach cause gastritis, while small doses often seem to have a sedative effect and to be retained when other things are vomited. In moderate doses alcohol promotes a flow of gastric juice, though this is more watery than normal, and it is questionable whether the sum total of digestive power is increased.¹⁵ A continued use of alcohol causes an increased elimination of etherial sulphates in the urine, indicating an increased intestinal putrefaction resulting from its use.¹⁶

In medicinal doses I have never seen any harm done the stomach or digestion. It is oftentimes retained in typhoid when other foods are vomited, and it is here that it has its peculiar value. The effect of alcohol on the storage of glycogen is interesting. It apparently accelerates the disappearance of glycogen from the liver. Inasmuch as fever produces the same result, we may be doubly sure of its absence from the liver when we give alcohol in typhoid.

The relation of alcohol to infection is a vexed question. There have been a large number of investigations carried on to show how alcohol affects infection, and the great mass of these experiments teach that alcohol before infection increases susceptibility, alcohol after infection decreases resistance.¹⁷ These experiments have been conducted on rabbits, birds, guinea pigs and other animals, but it is to be noted that the

¹⁴ *American Medicine*, Vol. iv, p. 61.

¹⁵ Cushny. *Boston Medical and Surgical Journal*, Vol. cxlvii, p. 34.

¹⁶ Hunt. *Studies in Experimental Alcoholism. Hygienic Laboratory Bulletin*, No. 33, p. 40.

¹⁷ Meltzer. *American Medicine*, Vol. iv, p. 61.

animals were not infected with the *B. typhosus*. The bacteria used were those of tetanus, diphtheria, anthrax, cholera, the streptococcus pyogenes, and the bacillus coli. The results, however, were quite uniform with the different kinds of infection.

Hare, who has tested the bacteriolytic power of the blood in animals infected with the colon bacillus, finds that alcohol tends to increase its bacteriolytic power.¹⁸

I have treated a considerable number of typhoid patients that had alcoholic histories. The course of the disease indicates that alcohol lessens the resistance to typhoid infection. These cases have as a rule gone bad. Pulmonary complications were more common, and, though the fever was not always high, the delirium and nervous symptoms were worse, and the prognosis was less favorable.

I would summarize the conclusions of the various authorities as follows:

1. Alcohol is a food. In moderate amount, it improves digestion, and protects the body fats and carbohydrates from metabolism.
2. It increases intestinal putrefaction.
3. It increases susceptibility to infection.
4. It depresses the heart, and determines the blood to the surface of the body.

The indications for the use of it in typhoid fever are emaciation and poor digestion of fats and carbohydrates.

It is not indicated for a failing heart or for nervous symptoms.

Intestinal antiseptics. Since the discovery of the Eberth bacillus, ideas regarding intestinal antiseptics have been gradually changing. Intestinal antiseptics still has its place in the treatment of typhoid, but its place is quite different from that originally assigned it. Intestinal antiseptics was the great desideratum so long as typhoid was regarded as primarily an intestinal infection. Now the evidence goes to show that typhoid is primarily a septicæmia, that is, a blood infection.

¹⁸ *Therapeutic Gazette*, Vol. xxxvii.

Cases of typhoid are reported without intestinal lesions,¹⁹ and Baumgarten thinks that typhoid ulcers should be regarded as metastases rather than primary lesions. Often intestinal changes are absent in typhoid cholecystitis though the bile contains enormous numbers of typhoid bacilli. In a large number of investigations, the typhoid bacillus is cultivated from the blood before it is found in the fæces. It is cultivated from the blood in eighty-nine per cent. of cases in the first week. Moreover, the *B. typhosus* is often absent from the fæces, and in many other cases it is found with extreme difficulty.²⁰ There is apparently some agency destructive to the *B. typhosus* in the lower part of the small intestine, for in cases where the *B. typhosus* is abundant in the bile it is absent in the intestine. If we regard typhoid as a septicæmia and consider that many of the toxines are produced outside the contents of the intestine, we cannot but regret the expenditure of therapeutic resources to drive the *B. typhosus* from its intestinal resting place. Much gray matter has been wasted in past years to secure a remedy that will render the intestines aseptic. I would not altogether condemn intestinal antiseptics, for they have their place. I have tested most of them, I think, with indifferent results. In the year 1903 I used acetozone on fifteen typhoids. The result was three deaths, all from perforation, a mortality of twenty per cent. I could not see that it influenced for good any of the intestinal symptoms.

The tympanites of typhoid is often an annoying symptom. Just what importance to attach to it, it is difficult to say, though I do not think it is so serious as it is often regarded. There are two elements at work causing it, one a paralytic condition of the muscular coat of the intestine, the other the gaseous fermentation of the intestinal contents. So far as it is due to the latter, intestinal antiseptics should be of value, for though intestinal antiseptics do not destroy the bacteria, they may be given in sufficient amount to retard bacterial growth. So far as tympanites is due to paralytic distention, intestinal antiseptics

¹⁹ Opie and Bassett. *Johns Hopkins Hospital Bulletin*, 1901, p. 198.

²⁰ Pratt and Peabody. *Journal of the American Medical Association*, September 7, 1907, p. 346.

are of little avail. As to the prognostic value of abdominal distention, we are in error if we think a flat abdomen with no tympanites gives a good prognosis. It has been my fortune to have three or four typhoid patients with flat abdomens, and, having a mild run of the fever, die from perforation, while beside them patients with extreme tympanites recover. Yet it is well to prevent the tympanites if possible, and here intestinal antiseptics have a limited value. Since recent investigations tend to show that typhoid is primarily a blood and gall-bladder disease, and that the intestines are affected only secondarily, the port of entrance of the *B. typhosus* is of great interest, whether it can be introduced into the blood current by the bite of an insect, a theory well worth consideration, or whether, as some hold, that the tonsils are the port of entrance. The latter view seems plausible, as Drigalski has found the *B. typhosus* in the tonsils of typhoid patients. Whether the tonsils are the port of entrance or not, the discovery of the *B. typhosus* in the tonsils would tend to emphasize the need of a thorough daily mouth disinfection as a prophylactic measure, and an equally thorough disinfection during the run of the fever, for doubtless the parotitis that occasionally complicates typhoid comes from the uncleanly condition of the mouth.

In conclusion:

1. Milk is not a suitable diet for typhoid patients. They need more carbohydrate and proteid.
2. Alcohol is useless as a heart stimulant in typhoid fever. It should be given as a food, when for any reason the patient cannot take enough carbohydrates.
3. Intestinal antiseptics can never have any specific effect on typhoid infection, but may be of limited value in preventing undue intestinal putrefaction.

DISCUSSION.

DR. C. J. BARTLETT (New Haven): It is well that Dr. Foote has focussed our attention upon these few of the essential factors in the treatment of typhoid fever and in that way has emphasized the importance of our recently acquired knowledge in modifying views previously held. I wish to speak only of intestinal antiseptics and of diet in this disease.

Any intelligent discussion of the value of chemicals to lessen the number of bacteria in the intestines in typhoid fever must start with the now well-recognized fact, as brought out in the paper just read, that this disease is not an intoxication from typhoid bacteria growing in the intestine, but a septicæmia, a general bacillary infection, with intestinal lesions; and with the further apparently established fact, that instead of finding conditions favorable for multiplication in the intestines, the typhoid bacilli decrease markedly in numbers from the gall bladder down, as shown by Pratt and Peabody and others. This indicates that some germicidal conditions are present here in typhoid fever, presumably also present in normal conditions. This is evidently directly opposed to the views previously held, largely on theoretical grounds, that a main factor of the disease is the absorption from the intestine of the products of growth of the typhoid bacillus. I say *theoretical*, for I am not familiar with any work which makes it appear probable that such products are actually absorbed. The results of animal experimentation are hardly applicable to a discussion of this disease in man, as it does not occur in the lower animals; but in so far as inferences may be drawn from them they do not favor the view that intestinal intoxication from the growth of typhoid bacilli occurs. Lower animals in general may be fed with typhoid bacilli in large numbers without harm, and this even when the stomach contents have been neutralized. On the contrary, subcutaneous or intraperitoneal injection of these bacilli frequently proves fatal, and this even though they multiply but little after injection. The fatal outcome is evidently due to toxic substances present in the bodies of the bacilli, which are set free in the tissues or peritoneal cavity. For some reason these toxic substances are not absorbed as such from the intestinal tract. They evidently must remain unabsorbed, or, before being taken up, are in some way rendered harmless. From the combined studies in man and the lower animals, it appears that the absorption of toxic products, from the growth of the typhoid bacillus in the intestines, may be entirely disregarded. The only indication for the use of intestinal antiseptics in this disease appears to be intestinal putrefaction, which has been sufficiently referred to by the author of the paper. There is, however, another point which has to do not directly with intestinal antiseptics, but with both the bacteriology of the intestines and with the question of milk diet. This is the danger of the introduction of large numbers of harmful bacteria into the intestine with the food, more particularly with milk. This has not been sufficiently recognized. Edsall, in a very recent paper, has called attention to this, and in view of the bacterial content of much of the market milk, the warning would seem to be timely.

I have had no experience with a liberal diet in typhoid fever. All I have used is of the milk and albumen water type, and this has been unsatisfactory. The anatomical conditions and the physiological function of the intestines are such that there would seem to be no reason

why a more liberal diet should not be given, provided this is in solution or fine suspension and easily digested. We know that absorption from the intestine is good in typhoid fever, that peptone and other ingredients of the food are absorbed as normal. Moreover, the reports from the Kiel Military Hospital entirely confirm the good results obtained by Shattuck and are certainly strong arguments in favor of a liberal diet in this disease. If we can accept as correct the description of the marked change for the better in the condition of patients when given such a diet, as compared with the usual diet, the increased interest in life which they show, the comparatively slight degree of emaciation, and at the same time, no increase, or even a decrease, in the mortality (and this, after several hundred cases, covering a period of three or four years, have been given this liberal diet and the results compared with the immediately preceding years at the same hospital), we are bound to consider whether the basis for our milk and albumen water diet is well founded. Recent contributions to our knowledge of the disease appear to me to show that neither from the standpoint of intestinal function, or of intestinal lesions, is there reason why a more liberal, easily digested diet should not be given, and also that the metabolic economy of the patient is conserved by it. The views expressed by Dr. Foote appear to be well within the limits of conservatism.

DR. GUSTAVUS ELIOT (New Haven): Mr. President, Ladies and Gentlemen: The writer of the paper has fortified the conclusions drawn from his own extensive experience, by reference to so many distinguished authorities, that one must exhibit no inconsiderable temerity who ventures to disagree with them.

For a considerable proportion of the mortality from typhoid fever the medical profession is responsible. Concerned in this avoidable mortality there are two principal factors. The first factor is the failure to make an early and correct diagnosis; the second is unskillful management of the case.

When I was a medical student, some thirty years ago, two principles of treatment in typhoid fever seemed to be fairly well established. One was the necessity for absolute rest of mind and body, with the patient in a recumbent position. The other was a strict milk diet.

During comparatively recent years, the milk diet has been vigorously and somewhat vehemently assailed.

The arguments against the milk diet are, first, to some patients milk is disagreeable; they do not like to take it. In the majority of cases this objection may be overcome if the physician insists upon the importance of his patient taking the milk, and if he modifies its taste by various additions.

Another objection is that the milk sometimes forms large, hard curds. This is true, but it seems to me, that while it is an unfortunate

occurrence, there is no danger of these hard curds producing perforation and intestinal ulcers, as some have professed to fear. It has seemed to me, also, that this formation of the large, hard curds might be avoided in most instances, either by the addition of lime water, or by partial or complete peptonization.

The third objection which has been urged against milk is that it ferments in the intestine, increases the congestion and inflammation of the mucous membrane of the intestine, and also causes excessive distension of the intestines with gas. This objection may be obviated, in a great measure, by partial or complete peptonization of the milk, and also by the administration of such drugs as will prevent fermentation in the intestine.

The fourth objection, and one which is perhaps the most important, is that the quantity of milk usually taken is deficient in certain ingredients, notably in carbohydrates. It has been a custom, I believe, with most physicians who employ the milk diet, to order the milk to be taken every two or three hours, in sufficient amount so that at least two quarts will be taken in twenty-four hours. Now, it seems to me, that most of you who have treated very much typhoid fever with the milk diet will agree with me, that, after the fever leaves the patient, this amount of milk is sufficient to enable the patient to increase in strength and also to gain weight.

There are many positive advantages in the milk diet. First, it does not require mastication, which in patients with fever and dry mouth is difficult. Second, it is easily swallowed. Third, it has no sour, bitter, or other pronounced disagreeable taste. Fourth, it is easy to get in a fairly fresh state. Fifth, its composition is fairly constant. Sixth, it contains a large quantity of water, which is useful in dissolving the effete products of metabolism and eliminating them from the system.

It therefore seems to me, that milk is an adequate diet in typhoid fever, and that it is the best diet because it is both adequate and safe.

There remains three-fourths of a minute to speak of alcohol and antiseptics.

Cardiac weakness, in the advanced stage of the disease, is, I believe, an important indication for alcoholic stimulants. I do not believe that they should be given in mild cases during the course of the disease. When given in mild cases they may be of some service in promoting the peripheral circulation, in preventing congestion, and in relieving the anxiety of the patient.

It seems to me that it is unwise to advise giving up the use of antiseptics. I have never been able to give any conclusive reason why antiseptics are useful in typhoid fever, but I believe that they are useful. If they do not destroy the bacillus, they may, at least, be useful in diminishing congestion of the intestinal mucous membrane, and in preventing extension of the intestinal ulceration.

Family Periodic Paralysis.

(A PRELIMINARY REPORT.)

MAX MAILHOUSE, M.D., NEW HAVEN.

Periodic paralysis is an affection rather infrequently mentioned in books on medicine or neurology. Its rarity, as well as its lack of a pathological anatomy, may possibly be considered sufficient reason therefor. The former, as well as its interesting features and importance from a prognostic viewpoint, however, have led me to think it of sufficient value to be brought to your attention.

Oppenheim is the only author who devotes any material space to it, in his work on diseases of the nervous system, and in this article he reports briefly one case. Tyson, in his work on practice (p. 1135), devotes one page to it. Two extensive articles have appeared in the literature in the English language; one by Taylor, in the *Journal of Nervous and Mental Diseases*, in 1898 (p. 637), and the other in *Brain*, 1901, by Singer and Goodbody, who also report a case, with critical digest of the literature up to that time. In addition to these two articles cases have been reported by each of the following: John K. Mitchell, in the *American Journal of the Medical Sciences*, December, 1899; J. J. Putnam, in the same *Journal*, in February, 1900, and Leo M. Crafts in the same *Journal*, in June, 1900. Mitchell's case was made the object of extensive research, without result, so far as etiology and pathology are concerned: the same may be said of the case reported by Crafts. Dr. Putnam follows up his case with an elaborate discussion of the possibilities, and is inclined to consider the paralytic phenomena to result from inhibition. Since the publication of these cases I find but a single one which resembles these and this I consider doubtful, although the author, Borstein, who reports it in the *Neurologisches Centralblatt*, 1905,

under the title of *Asthenia Paroxysmale*, believes it to be a special type of this affection; in his case, however, there was never complete paralysis, the voice was at times affected and the mentality was disturbed, i. e., some degree of mental depression was present. In my opinion *pschasthenia* was the predominant factor in his case.

The affection is so unlike anything else in neurology that one is at once struck by its salient features. These are, repeated attacks of a more or less complete flaccid quadruplegia, of sudden onset, usually nocturnal, with diminution or loss of deep reflexes, loss of nerve and muscle response to the electric current corresponding in time and degree to the paralysis, and restoration of function and electrical excitability in from six to thirty-six hours. All this with unimpaired intellect, freedom of cranial nerve involvement and unimpaired sensation. In about two-thirds of the cases reported there has been a history of the appearance of similar cases in the same family, going back through five generations in the case reported by Taylor. Many features of the affection are still unsolved, particularly the etiology and pathology.

The case which I have to report is that of a boy, X, who presents the following family and personal history, no case of like nature having occurred in the three preceding generations, so far as can be learned, and I am personally familiar with many of the facts. The father of X, now about forty-nine years of age, is short of stature, as was his own father, the former measuring at present five feet two and one-half inches in height and weighing 116½ pounds; he suffered from acute articular rheumatism when a youth and since that time has had occasional slight attacks of myalgia; he is also of a mild nervous temperament; his own father died of chronic myocarditis, his mother of carcinoma (operation and recurrence); his father died at sixty-nine and his father's mother at eighty. One sister was paralytic from birth and died, age ten, never having walked. (Smallpox in mother.) The mother of X is very neurotic, has had hysterical tremor, and is very hard of hearing; this was also the case with her father and two sisters,

one of whom died recently of pneumonia; her father was asthmatic and died of some cardiac affection; her mother came from a very healthy and long-lived family, in some two or three members of which asthma appeared; her mother died comparatively young, though having given birth to three sons and five daughters, of some cause connected with childbirth. X has one sister and one brother, both well; sister is also undersized.

Status Presens. Our patient, a schoolboy, was fourteen years of age in March, 1908. He is very well developed mentally and is of a decided mechanical turn of mind. His height is four feet nine and one-fourth inches and he weighs eighty-eight and nine-sixteenths pounds. His development was normal; he went to kindergarten at five and will enter high school in another year. His face exhibits slight pallor and has always done so; it also presents a sleepy, sheepish look, but this is due to its conformation and not to any defects in muscular power. His forehead is quite frequently wrinkled, as if he kept his eyes open with difficulty. Father says he is a great meat eater. He had whooping cough at three and one-half years of age, scarlet fever at five, measles at twelve and chicken-pox in the interval between the two latter.

Patient has been riding bicycle and playing ball, as boys of his age do, but more of the former. He says that at school in winter he has frequently, almost daily, been troubled with aching of the feet, which he attributed to draught from (exhaust) ventilator, which was near the floor in the wall of the school-room and not far from where he sat.

Onset and Course. One morning in *August, 1907*, after lying about in the damp grass on the lawn (in the country) on the previous evening, on awakening he found himself unable to stand; his hands were not affected; in four hours he was again able to walk; he had some pains in his legs at this time.

His second attack occurred on *November 24, 1907*; this followed attendance at dancing school, affected both arms and legs in moderate degree and passed off in two days.

His third attack occurred on *December 1*, and was similar to the second attack; some pain was complained of in the limbs, but no joints were found swollen. Heart found normal.

Fourth attack, January 15, 1908; a spell of weakness of arms and legs lasting about two days, with pain on attempts at moving limbs.

Fifth attack, January 20. Awoke at 1:30 A. M. and could move neither arm nor leg. At 8:30 A. M. I found him in bed, head propped on pillows and all four extremities paralyzed, except for slight movements of fingers and toes; he complained of slight pain in one tendon Achilles; on the following morning he could move all limbs normally; his power had returned rather suddenly about 3 or 4 A. M.; he had walked to the bathroom unassisted, previous to my arrival; his parents had attributed this attack to indigestion and constipation and had given him a purgative. Examination on January 20, while paralyzed, revealed normal facial and ocular muscles; he was unable to hold up his head unsupported and it would fall over to one or the other side.

Sixth attack, February 12; since last attack has had some pains in calves at times; yesterday looked pale; seemed to drag one leg a little; to-day awoke at 4 A. M. and found his legs weak; examination revealed a paretic condition of his legs and thighs but no complete paralysis; these muscles responded to a strong (painful) faradic current; sensation was normal throughout as was also muscle-sense. The back muscles were weak and he could not sit up; knee jerks could be elicited. Facial muscles all functionate normally. No thirst or perspiration. Urinates normally. Examination of heart revealed no murmurs and a normal area of percussion dullness. Was reported well the next morning.

Seventh attack, February 29. Reported. A mild attack affecting the lower extremities only. This attack came on gradually; in the morning, he went downstairs soon after rising and when he reached the dining room his legs gave out completely and he had to be carried back to bed; in the evening he was able to walk to the bathroom unassisted.

Eighth and Ninth attacks, March 11, and 14; had a slight spell on each of these days.

Tenth attack, March 21; fell helpless in evening; after massage got up and walked; and on March 22 awoke paralyzed in his four extremities. I saw him toward noon and found his right arm and forearm merely weak; in left upper extremity there was only ability to flex fingers somewhat; lower extremities powerless, except for ability to move the toes of the right foot. A tetanizing current does not exhaust the flexors of left forearm; no response to faradism in extensors of left forearm and in left anterior tibial group of muscles. March 23 reported practically well again. He then developed a subacute otitis media, tympanum was punctured about March 31, and on.

April 2 he had another mild general attack of brief duration. Examination at various times in April, at my office, revealed normal supinator, knee and Achilles jerks. Dynamometer, right hand fifty, left hand forty-seven. Stands well on either foot. Muscles react well to faradism. He states that for the past six months he has had attacks of weakness, with aches in the legs which he worked off by walking about; damp, rainy weather brings on aches in calves.

On May 11 he rode his bicycle quite a little and later was massaged; it was a hot day and evening; during the evening his neck ached; he perspired very freely in his sleep, the night grew cooler and he awoke.

May 12, at 4 A. M., completely paralyzed, except that he could move his forearms somewhat, but this power soon left him; by 7 A. M. he could move his fingers again. I found him at 8 A. M. reclining in bed and able to flex fingers and toes only. Face and eye muscles normal; swallowing and whistling normal. Attempts at coughing produce a feeble cough, the expiratory effort being feeble and the cough husky; the head wobbles about on attempts to hold it erect and complete flexion and extension are impossible; deep inspiration is abdominal and chest moves but little. Says he feels short of breath. All deep reflexes are absent. Plantar flexion of toes on tickling sole of foot. There is no response to a strong faradic current in exterior popliteal nerve or anterior tibial or peroneal muscles of left leg, nor any in left musculo-spinal nerve or extensor

muscles of left forearm. The flexor muscles of left forearm react readily to strong faradic current; less so to a feeble current. Pulse ninety-two and of good quality; heart normal on percussion and auscultation; in the evening, passed urine normally, though limbs were still paralyzed as they were in the morning. During the night he asked to have his limbs shifted from time to time as they ached when long in one position; his legs were also supported on pillows to relieve the pain in the heels produced by pressure; he was given a dose of bromide of potassium; went to sleep at 4 A. M. and awoke at 8 o'clock with the ability to move his limbs, in all directions, restored; there is still some weakness in his limbs when moved against resistance, or when he resists passive motion. The deep reflexes are now normal, as are the responses to faradic currents; the flexors of fingers and wrist respond better to mild faradic currents; deep respiration is now thoracic in normal degree; myotatic irritability has returned; this was found absent yesterday in the arms, in the extensors of the forearm and very feeble in the pectorals. Irritation of sole of foot now produces retraction of leg and thigh. Pulse now eighty-seven.

Further examination at my office on May 17 revealed Achilles jerks normal and equal on the two sides; this reflex was more pronounced than that of the knee-jerks; these were present, not very strong, and were increased but little on reinforcement. The deep reflexes in the upper extremities are not obtainable, except mild supinator-jerks. The heart sounds and area of percussion dullness are normal. Electric examination: Tetanizing faradic current frequently repeated reveals no increasing weakness of response in extensors of forearm. Galvanic test; K.C.C. > An.C.C., but the response, though normal in vigor, is tardy as to time.

Patient says he has never had any difficulty in masticating food, or in swallowing during an attack. Ever since his first attack, in the normal intervals, he awakens with a numb feeling in both hands; during the early period of an attack he feels tired, and if he folds his hands at this stage they perspire. When awakening in an attack he finds himself in a free perspiration. Following an attack, he says, his calves ache.

His attacks always begin between 1 A. M. and 5 A. M., and vary in duration from six to eight hours to thirty-six hours; the last one was about twenty-four hours in duration.

He has never had diplopia at any time in his life, could always urinate while paralyzed and has been able to defecate at such times. As in some other cases reported, he sometimes awoke to find his legs and arms slightly weak, which condition could be dissipated by walking about; this was never followed soon after by a severe attack, as occurred in some of the cases reported by others.

Summary. In August, 1907, a boy thirteen and one-half years of age, with a rheumatic and neurotic heredity, slightly anæmic in appearance, undersized, and a great meat eater, otherwise a normal boy mentally and physically, retires after an evening on damp grass and awakens paraplegic; this paralysis passes off in several hours. Subsequent attacks November 24, December 1, January 15, January 20, February 12, February 29, March 11, March 14, March 22, April 2 and May 12. The shortest interval between attacks was three days, the longest some three months, which was between the first and second attacks. The paralytic phenomena varied in the several attacks from moderate paraparesis to more or less intense quadruplegia. In one attack there was for a time complete paralysis of all four extremities, which soon, however, moderated so as to permit of flexion of toes and fingers; his neck muscles were also frequently involved so that he was unable to hold his head erect. The deep reflexes were diminished or lost according to the intensity of the paralysis; the paralysis was always a flaccid one. Electrical responses also disappeared *pari passu* with the loss of muscular power, being lost in the nerves and muscles of the limbs and sections of limbs when these were completely paralyzed, and enfeebled when and where there was a paretic condition. The muscles of organic life were apparently uninvolved. There was no impairment of sensation, tactile, pain, temperature and postural sensations being normally perceived. The accessory respiratory muscles were involved, as shown by the abdominal type of respiration on forced deep breathing.

Other interesting and peculiar features are the time of onset, between 1 and 5 A. M., the duration of the attacks, from six to thirty-six hours, the normal condition rather speedily restored after an attack and the normal electrical responses shortly before and shortly after an attack. Rather profuse perspiration accompanied some of the attacks and some spells could be aborted. I could make out no cardiac dilatation at any of my visits, though this feature is much commented upon by several reporters.

Taylor sums up fifty-three cases of this affection after eliminating all doubtful ones; of these eighteen were sporadic. But six reports have been made by American physicians, namely, Taylor (two cases), Burr, Rich, Putnam, Mitchell and Crafts. The case reported by Singer and Goodbody is the only one up to that time reported in Great Britain.

One striking feature of all the cases reported is the fact that but one of them has been fatal; this was the case of a man fifty-three years of age; it has been placed among the doubtful cases by Taylor for reasons other than age. In many cases the attacks seem to become less frequent as time goes on and ultimately cease toward middle life.

Careful inquiry reveals nothing similar in the family of the father four generations back, or in that of the mother three generations back. There has been a family history of periodic paralysis in about two-thirds of the cases heretofore reported. In this regard this condition resembles that of the progressive muscular dystrophies, where sporadic cases not infrequently appear.

It has been said by some authors to resemble progressive muscular dystrophy in some of its phenomena, by others myotonia (on account of its periodic occurrence), and by others myasthenia gravis; some consider it functional in character, a variety of myopathy (Oddo and Darcourt in *Arch. d'Elect. Med. Exper. and Clin.*). There is room here for many surmises, but thus far no results have been obtained from investigations made by some of the reporters. J. J. Putnam, after a review and analysis of the literature, is led to believe that inhibition plays a prominent rôle in the development of the

symptoms and also likens the paralytic phenomena to those produced by curare.

Crafts had blood, fæces, saliva and urine examinations made and claims to have extracted from the fæces a toxic substance which produces transitory paralysis in rabbits and guinea-pigs.

Goldflam, who described and studied six cases and reported in 1890, calls the generous term auto-intoxication, in all probability (he says), to account for the production of the symptoms. This, of course, is merely begging the question, and, as our investigations will show, one must look for evidence of this in the functioning of tissues or metabolic rather than intestinal auto-intoxication, for the urine in our case showed no excess of indican after test meals.

While mentioning suggested theories, I might be pardoned for offering one of my own as a possible factor in these cases. Recently MacCallum has brought out the fact that in cases of thyroidectomy, with removal of parathyroids tetany results; when the parathyroids remain tetany does not appear. Furthermore, this tetany (experimentally produced) may be made to disappear temporarily by the introduction into a vein, or subcutaneously, of calcium salts (these being deficient in the blood of the animals operated upon); after a while the tetany returns, to be again more or less permanently relieved by the calcium injection. These may be called cases of hypertonicity or spasticity or tetany. In the cases of periodic paralysis there is a condition of flaccidity, hypotonicity or anergy; possibly there is an excess of calcium salts in the blood or muscle, possibly due to altered metabolism, possibly to over-functioning of the parathyroids. However, without anticipation on our part, I have requested Professor Lafayette B. Mendel, professor of physiological chemistry in the Sheffield Scientific School, to make a series of investigations, with a view to ascertaining, if possible, some facts in the way of abnormalities that might be present in this patient; and this with results that are of interest and which bid fair to be of practical value. Firstly, however, an examination of the blood was made, with negative result, however; this showing 5,200,000 erythrocytes, 10,000 leuc-

cytes and a hemoglobin percentage of seventy to seventy-five. No differential white count was made as it was not considered material. Before examining the excreta during and after an attack it was deemed advisable to determine their status while the boy is in his own normal state (if it is normal), and so an interperiodic examination of his stools and urine has been undertaken, beginning several days after his last attack and while he is up and about and feeling well. Thus far we are prepared to report only on the examination of the fæces, which already provides a matter of some interest. He was placed upon a moderate diet of fine chopped beef, bread and butter, potatoes and eggs, etc., a liberal diet, but free from vegetables and fruits, which might leave a residue of vegetable fiber in the fæces. After being on this diet for six or eight hours, he was given 10 grains of lampblack or soot. Such a diet should, if all of his secretions were normal and digestion properly performed, give fæces free from fats, starches, muscle-fiber and connective tissue, as these are all normally disposed of in the digestive tract. The stools following the ingestion of this diet and its lampblack should, when passing through and colored black, show when rubbed up with water, simply a muddy fluid. This diet and these examinations were pursued for three days and each of these days revealed identically the same condition of the fæces, namely, absence of starch, fats and muscle-fiber, showing that intestinal digestion was properly performed and so far as absence of muscle-fiber is concerned, that gastric digestion was normal. The water-triturated black fæces, however, did show something that should not have appeared with normal digestion of this diet, and this was numerous flakes of some solid substance, which, when washed, appeared to be either mucus or connective tissue shreds. Under the microscope this is plainly shown to be connective tissue, and this is further proven to be so by the fact that these washings will swell up and become transparent, while mucus will shrivel when placed in a solution of acetic acid. Here, then, is one factor in this boy's economy that is wrong. His gastric digestion is imperfect in that he is unable to care for the connective

tissue that he consumes in his meat. How much this has to do with his attacks of paralysis we do not yet know; it is possibly a factor, though not *the* or the only one. Such a series of investigations has not heretofore been made in any of the reports of cases that appear in the literature up to the present time. Later on we expect to report on abnormalities in the urine, the condition of acidity of gastric juice, etc., all of which may prove to be of benefit from a therapeutic standpoint, and possibly an aid to the solution of the etiology of this rare and heretofore obscure affection.

DISCUSSION.

DR. CHARLES N. HASKELL (Bridgeport): Dr. Mailhouse is to be congratulated for having a case of such rarity come under his observation. He is to be complimented on his ability to recognize so rare a condition, when it did come under his observation; and, further, for the lucid manner in which he has presented the facts to us. I regret to confess that I failed to appreciate the conditions that presented in a similar case, which came under my observation some three years ago and which I promptly relegated to that capacious waste basket for nervous disorders—hysteria. The truth never dawned upon me until I was invited to discuss Dr. Mailhouse's most interesting paper.

So far as I can learn, only sixty-four cases of this disease have been reported. There is little in the text books, although Church and Peterson's work describes it fairly well, and the literature on the subject is not especially voluminous. Taylor's article in the *Journal of Nervous and Mental Diseases*, in 1898, and referred to by Dr. Mailhouse, is by far the best article in English on this disease. A more recent article by Buzzard, in the *Lancet*, in 1901, is extremely interesting from the fact that a new theory of the causation of the disease is advanced. It seems that the disease is essentially one of heredity, although there is a fair percentage of sporadic cases reported, and Dr. Mailhouse's case is evidently one of the latter. It would have made the picture a trifle more attractive and complete if the patient had consulted the doctor in the matter of choice of his ancestry. Thirty-five cases have occurred in three families. Nineteen of these in one family. It is needless to rehearse the symptoms, which Dr. Mailhouse has so graphically described. My attention is attracted by the statement that there are no sensory disturbances in this disease, while, in a majority of the cases that I have studied, there were at least some minor sensory symptoms which should be taken into account. These are, in Dr. Mailhouse's case, pain in the legs, aching of the feet, pain in the limbs, pain in the heels.

In other cases, various parasthesias, numbness and pins and needles sensations in the limbs, itching, etc. These facts have the significance that the sensory tracts are involved to a slight degree, but do not entirely escape. The disease is essentially a motor paralysis. I am interested to know, in connection with the history of the case under consideration, whether the patient had ridden his bicycle, or indulged in active exercise of any kind previous to his first attack. Dancing preceded the second attack. No mention is made of exercise preceding the ten attacks following, but the last attack followed a bicycle ride. It would seem that fatigue and exposure are to be regarded as the exciting causes of the attacks. Rich's cases were all due to cold or dampness. I wish to mention Buzzard's theory of causation. He advances the argument that there may be a stagnation of lymph in the muscles, and his idea is supported by the fact that muscular exercise causes an increased flow of lymph and that muscular contractions manufacture it; that the paralysis appears only after a period of rest following exercise, and that an attack may be, at least temporarily, aborted by exercise or massage, which would prevent stagnation of lymph. Dr. Mailhouse's theory of excess of calcium salts in the blood or muscles affected is extremely interesting, and I am sure we shall all watch the results of the investigation in this line. From the fact that lymphocytosis and leucopenia have been observed in a number of cases, I would suggest that a differential blood count be made in his case under observation. John K. Mitchell states that in his case the most careful and scientific examination of the feces, before, during and after attacks, failed to show the slightest deviation from normal. I must insist, however, that the condition is one of motor paralysis pure and simple, that it cannot be likened in any way to hypotonicity, for there is no demonstrable hypotonia. Again, this condition cannot be compared with the various myotonias, paramyotonias, myasthenias, muscular dystrophies, etc., for it is periodic in nature, and the electrical changes are not the same. Auto-intoxication is most generally held responsible for the disease, although recovery takes place with diminished excretions. Hysteria is promptly ruled out, from the fact that muscular excitability to volitional, mechanical, electrical or any other stimuli is absolutely wanting. Cases of a like condition, reported by Gibney and others and cured by quinine, have been discredited. They were undoubtedly due to bacterial invasion of the cord, with more or less hyperæmia and possibly œdema. I would call attention to the fact that the age of a majority of patients suffering from periodic paralysis nearly approximates the age of puberty. No mention has been made of the fact that a goodly number of the cases have experienced their initial attack after bicycling, and also that the first case reported was at about the time of the advent of bicycles. I may be

pardoned, also, for offering a theory regarding the causation of periodic paralysis. It is a well-known fact that muscular exercise produces various chemical changes; for instance, the formation of sarcolactic acid, creatin, creatinin, inogen, a proteid residue of myosin and a change of glycogen into sugar. There is also found in muscle tissue xanthin and hypoxanthin, inosite, etc. My idea is that when a muscle is unduly exercised in certain individuals, a substance is formed, possibly an excess of one of those just mentioned, or a substance as yet unknown, which acts as an insulator, cutting off the direct relation between the end plates and the muscle fibre. It has been found that extirpated muscle fibres, in periodic paralysis, show definite pathological changes; namely, enlargement and separation of fibres and vacuolation. These vacuoles may contain the substance sought for. Again, the substance may be absorbed and carried to the spinal cord, where it may separate the neurone body from its axone. After a variable period, this defect in metabolism or catabolism resumes the normal and the individual recovers. This same theory, applied to chronic conditions, may explain some of the dystrophies and atrophies of unknown cause. The analogy of a nerve impulse to an electric current is, I think, admissible, in the light of present knowledge of the minute anatomy of the nervous system. It is interesting to note, in this connection, that in karyokinesis, chromatin skeins radiate in the line of magnetic force. I trust that my theory may be reconciled with that of Dr. Mailhouse, and that one of the internal secretions, or possibly calcium salts, may prove to be the insulating substance. I wish to thank Dr. Mailhouse for his most interesting paper and also for the privilege of discussing it.

DR. LAFAYETTE B. MENDEL (New Haven): I am indebted to Dr. Mailhouse for the opportunity to make a study of this case a few days after one of the attacks which he has described. The picture presented by the attack reminds one of the condition which prevails in an animal poisoned with a drug like curare. Aside from pathological factors which a physical examination might reveal, the situation suggested a search for some toxic substance which could have been thrown into the circulation. In previous investigations a possible gastrointestinal origin of the toxic agent has been suggested. It occurred to us that a careful examination of the urine might reveal a disturbance in the metabolism of some organ or tissue in the body.

When the boy was subjected to a Schmidt test diet for several days, we were surprised to find a marked inability to digest the connective tissue of meat, plainly indicating a deficient gastric function, although there was an apparent absence of any other signs of indigestion. The meat fibres themselves were perfectly digested, since they can be altered by the pancreatic secretion; whereas connective tissue cannot be disintegrated in the alimentary tract, until it has first been altered by the acid of the gastric juice.

This abnormal finding recalls the theories of auto-intoxication in connection with such cases. In earlier years much stress was laid upon an examination of the urine for toxic properties. All such investigations, in particular those of Dr. A. E. Taylor in the Philadelphia cases, have been negative, from the chemist's standpoint, and the possibility of toxic qualities of the urine is not regarded as significant to-day, as it was a few years ago.

We are not ready yet to report on the observations which the urine examinations have afforded, because the data are too few to be convincing. There are, however, some indications of a disturbed metabolism of the muscles. I mention this because it affords another hypothesis regarding the etiological factors in this case. We may picture to ourselves a highly abnormal muscular system, or an abnormal gland, which may ordinarily function fairly well. Some toxic or unusual substance, thrown into circulation at the proper moment, may induce abnormal phenomena in such a defective organism, under conditions in which the ordinary individual would be perfectly immune. We would thus be dealing with an organism or a part that was, chemically speaking, over-sensitive.

In conclusion, I would like to make a plea that such cases be studied from the standpoint of pathological chemistry—that the possibilities of a chemical diagnosis be considered in relation to the physical diagnosis.

DR. MAX MAILHOUSE (New Haven): I will merely say a word or two in closing with regard to the symptoms. These are solely subjective in this case; they are not objective. With regard to the attacks that follow an exposure, or exhaustion, undoubtedly these are causes of attacks in very many cases, but in this particular case there were evidences of slight exposure and slight degrees of fatigue, possibly due to his bicycle riding, although this did not precede the majority of the attacks.

The theory of lymphatic status is an interesting one and might provoke endless discussion. It is purely a theory at the present time. And I doubt whether it will go much further than that.

The possibility of its being hysteria has been considered by myself and it has also been considered by all of the men who have written upon the subject. But the very fact that in all cases of hysteria heretofore reported, or that we know anything about, electric reactions are normal, while in these cases the responses to electricity disappear, negatives such a diagnosis. Furthermore, in cases of hysteria, the deep reflexes are preserved. These two facts, alone, seem to me to be sufficient to throw out the question of hysteria entirely in these cases.

The literature of these cases was, unfortunately, hurriedly investigated, and I had not time to go very extensively into recent literature, and for that reason I hope I may be pardoned for not having the more recent references.

Acute Pleurisy with Effusion.

NELSON A. POMEROY, M.D., WATERBURY.

The pleuræ are two separate serous sacs which invest each lung to its root, and are reflected on to the thoracic walls and pericardium. The two pleuræ are distinct from each other, and do not meet in the median line except behind the second piece of the sternum. At the root of the lung the two layers of the same side are continuous, and at the lower part of the root, a fold runs down to the diaphragm. The space between these two layers is called the cavity of the pleura, but, as a matter of fact, in the healthy condition, the two layers are in contact, and there is no real cavity, until the lung becomes collapsed, or the two layers separated by an effusion. The pleura is a connective tissue membrane, composed of fibrillated connective tissue, with its basement substance and cells, and covered over its free surface by a layer of endothelial cells. Imbedded in it are nerves, blood vessels and lymphatics.

Pathological Anatomy. The first change in the pleura is a slight reddening, although its glistening appearance is not immediately lost; then there is a falling off of the endothelial cells, and the membrane loses its glossy appearance and looks dull and opaque, this change being due to a finely granular layer of fibrin, unevenly distributed over the inflamed surface. Fibrinous exudation rapidly increases, and soon the pleura is covered with a more or less shaggy membrane, consisting of small knobs and threads of coagulated fibrin. In many cases the opposite pleural surface is likewise involved, and the two become temporarily agglutinated, bands of fibrin passing from one surface to the other. While these changes are taking place on the surface, important changes are also taking place in the substance of the pleura itself, and in the deeper layer of the newly formed false membrane. At first the superficial blood

vessels become engorged with blood, the lymph channels are distended, some of the endothelial cells fall off in patches, and a fine reticulum of fibrin may be seen between and overlapping the endothelial cells; then there is a new growth of connective tissue cells from the pleura and an emigration of leucocytes from the blood vessels. After this the new connective tissue cells entangled in the fibrin become more numerous, and a basement substance and new blood vessels are formed. (Delafield and Prudden.) At the same time serum begins to collect in the pleural cavity. The fluid exudate is found in exceedingly variable quantity, oftenest perhaps amounting to one to two pints, sometimes to a gallon or even more in a single pleural cavity. Its color in a fresh effusion is usually an amber, like that of urine; in an older one it is likely to become much darker, varying from a brownish shade of yellow to almost black, from the presence of more or less decomposed blood. According to Ewald, its chemical constitution is almost identical with that of blood serum, except that there is a larger proportion of water.

Etiology. Pleurisy is a disease of all ages; it is not infrequently met with at both extremes of life, and in children in particular it has come to be recognized as of common occurrence. It is most frequent in January and April, least so in September and October. It is about four times more common in males than in females. There seems to be an individual predisposition to pleurisy in some cases, and the same person suffers from several attacks. Exposure to cold and wet, trauma,—either a simple contusion, or a fracture of a rib, or a penetrating wound—inflammation of the lung, rheumatism, gout, syphilis, the infectious diseases, especially influenza, cardiac and renal disorders are the regular causes of pleurisy. Also parietal affections, such as abscesses and tumors of the breast or axillary glands, and caries of the ribs and vertebræ. It may be secondary to pericarditis, to malignant disease of the œsophagus or mediastinum. Abdominal affections may give rise to pleurisy, such as peritonitis, appendicitis, ovarian cyst, cirrhosis and abscess of the liver. Finally, inflammation of the pleura may occur without discoverable cause, the so-called idiopathic form.

Symptoms. An acute pleurisy usually sets in with a pretty sharp chill, more rarely by chilly sensations, which may persist for several days, followed by pain in the chest, fever, cough, dyspnœa, and a very considerable degree of constitutional disturbance. The pain is usually sharp and lancinating in character, but sometimes begins as a simple soreness which later becomes more acute and localized. In some instances the pain is so severe as to cause signs of collapse. The pain is felt oftenest just outside the nipple, in the fifth or sixth interspace, but may be referred to some point in the back, or beneath the sternum, or in the abdomen, or even to the well side of the chest. The source of the pain was originally supposed to be caused by the rubbing together of the two inflamed pleural surfaces; but the frequent occurrence of friction without pain contradicts this view, and it is now generally believed that the pain is due to an involvement of the intercostal nerves, hence its existence in places at some distance from the site of inflammation. The pain is increased by pressure, or any movement which disturbs the parts, particularly deep breathing and cough.

The fever varies exceedingly in different cases; it usually rises abruptly to 101-104, and is attended by the usual headache, furred tongue, anorexia, muscular pains, and other accompaniments of fever. In the majority of cases the fever continues high for a week or ten days, and then becomes remittent, with a gradually diminishing evening exacerbation, until at the end of another week it has fallen to normal. In some cases, however, the initial high temperature may almost immediately subside, and a slight hectic fever continue until the effusion is entirely absorbed, on an average from one to two months.

A varying degree of dyspnœa is a very constant symptom of pleurisy; its severity is at first directly due to the pain caused by a full inspiration and the fever. Later the growing effusion causes a pulmonary retraction and consequent diminution of aërating surface, and later also interference with the circulation from pressure upon the heart and great vessels. It is quite

common, as the effusion progresses, to meet with a high degree of orthopnoea and cyanosis; the recumbent posture becomes impossible, and all of the accessory muscles of respiration are brought into play.

The cough is usually, at the outset, short, dry, painful and ineffective, expectoration being very slight or absent; later it changes its character, and becomes more paroxysmal, often induced by change of posture, as from the recumbent to the sitting position.

During the first stage of pleurisy the patient usually lies on the well side to avoid pressure, but as soon as considerable effusion has developed the posture changes; he now lies upon the affected side, to give freer play to the well lung.

Physical Signs. On inspection, there is restricted motion of the affected side, dependent in the early stages on pain, and later on the accumulation of fluid, which, if large, may cause an obliteration or bulging of the intercostal spaces. In left side effusions there is frequently displacement of the heart beat to the right of the normal line.

On palpation, the most valuable sign is the almost invariable absence or diminution of vocal fremitus over the portion of the chest where the fluid is in immediate contact with the chest wall. Over the lung itself, fremitus is normal if the effusion is only small or moderate. In a large effusion, fremitus is usually increased over the lung because of its solidified condition. In a large left-sided effusion, the heart's impulse may be felt in the epigastrium, or in the fourth or fifth interspace to the right of the sternum. In effusion on the right side, the impulse beat may be felt outside the left mammary line. The liver and spleen may be pushed downward a varying distance below the ribs, simulating enlargement of these organs.

Mensuration. In large effusions the affected side is frequently found to exceed the other by one-half to two inches.

Percussion. Wherever the effusion is in contact with the chest wall, the percussion note is flat. It should be remembered that the level of the fluid is not a hydrostatic one, but from the elasticity of the lung, the upper level of the fluid

assumes a shape resembling the letter S, with its highest point in the axilla; this has been named by Garland the "letter of S curve." At the level of the fluid there is dullness on percussion. Above the level of the fluid, if the effusion be small the percussion note may be unchanged, or the resonance may be a trifle increased and slightly tympanitic. In large effusions, over the compressed lung in front the percussion resonance is exaggerated and high pitched, or tympanitic; behind, the percussion note is dull, sometimes quite flat.

Auscultation. The friction sound, which usually ceases upon the appearance of fluid, is an early sign of acute pleurisy. When the portion of pleura overlying the heart is inflamed, a variety of friction called by Wintrich the "pleuropericardial friction sound" is not infrequent. As a general rule, the respiratory murmur over the fluid is diminished, and in some cases totally absent. The quality of respiration over the fluid is approximately vesicular, so long as the lung is uncompressed. When compression begins, the quality changes to broncho-vesicular, or even bronchial. The voice sounds are found in general to correspond to the respiratory murmur in quality and intensity. At the level of the fluid is occasionally heard a high-pitched sound of a bleating or plaintive quality, called by Laennec ægophony; it possesses no great clinical importance. The peculiar distinctness with which the whispered voice is transmitted through a serous effusion, sometimes called "Baccelli's sign," or "aphonic pectoriloquy," was once thought to be distinctive of a simple serous exudate. It is now known to be neither constant in the latter nor peculiar to it, and of small diagnostic importance. Upon X-ray examination, the presence of a serous exudate in the pleura may cause a dark shadow in the fluoroscopic picture, or upon the plate, and show a displacement of the diaphragm downward. On the unaffected side respiration is louder the larger the effusion and the greater the compensatory efforts of the sound lung. Grocco's sign, a triangular area of dullness, lying along the spine, upon the opposite side to that upon which the fluid is found, may be present. This area is bounded by the line of the spinous

processes of the vertebræ, by the lower limit of normal pulmonary resonance and by a line rising from this boundary to the median line, at or about the upper limit of the dullness due to the fluid. The base of this triangle is one-half to one inch or more in length. It was once thought that this paravertebral triangular area of dullness was pathognomonic of an effusion into one of the pleural sacs, but it is now known to be found in affections where the pathologic process is entirely outside of the thorax.

The diseases with which acute sero-fibrinous pleurisy is most likely to be confounded are pneumonia, mediastinal and pleural tumors, aneurisms, peripleuritic abscesses, tumors of the liver and spleen, pericardial effusion, hæmothorax and hydrothorax. The most frequent complications occurring with an acute pleurisy are pericarditis, pulmonary œdema and certain peculiar cerebral disorders.

Prognosis is usually good.

Treatment. The patient should be confined to bed, and placed on a restricted diet, consisting largely of milk. The ingestion of chlorides should be reduced to the smallest amount possible. The bowels should be kept freely open by seidlitz powders, citrate of magnesia, or some similar saline cathartic. For the cough, if troublesome, small doses of codeine every four to six hours will give relief. For the pain it is usually necessary to give opium in some form. Morphine by the hypodermic method is preferable, since it can be repeated without danger until entire relief is obtained. Locally we may apply dry cups, or the actual cautery, or irritating liniments, or a mustard and flaxseed poultice frequently renewed. The clay poultice is an abomination I mention only to condemn. The strapping of the affected side with adhesive plaster, applied in the same manner as for a fractured rib, will usually give great relief. Among the internal remedies, sodium salicylate, given by the mouth, in ordinary dosage, seems to deserve the most confidence. If there is a history of syphilis, a course of mercury and one of the iodides may have a specific action. In a large percentage of cases, treatment by external and internal

medication fails entirely to secure a favorable termination of the disease, so that we are often perplexed to determine whether the unsatisfactory course is due wholly to the malignancy of the disease or in part to the imperfection of the treatment. For several years quite a large number of physicians, notably Dr. Delafield, have advocated the withdrawal of the fluid by thoracic paracentesis, as soon as enough has accumulated to give physical signs. It is this way of treating a sero-fibrinous pleurisy, whatever the cause, by early and repeated tapplings, that I wish to emphatically recommend. The technique of the operation is too well known at the present day to need recapitulation by me, but it will do no harm in passing to urge that all the rules of aseptic surgery be carried out to the letter. The operation at this early period may safely be done while the patient is in the sitting position. No effort is made to leave a portion of the fluid to be removed by absorbents. As a rule, with few exceptions, a repetition of the operation is not needed; the lung expands and the normal respiratory sounds reappear. More or less pain or discomfort is sometimes complained of in the affected side, but convalescence is rapid and unattended by great prostration, and the recovery is complete. The dangers attending an untapped pleural effusion are well summed up by Hadley, as follows: "Permanent damage to the lung, which if long collapsed, will undergo fibroid changes; also thickening of the pleura, which prevents complete expansion subsequently. Sudden attacks of syncope, which are frequently fatal. These occur chiefly with large effusions. It is very difficult to tell whether an effusion is large or small by the physical signs. Protraction of the case to the detriment of the general health of the patient."

The supporting and alleviating treatment of pleuritis, combined with early thoracentesis, seems to possess the following positive and negative advantages: It is easily and safely done; it does not add to the local inflammation, but actually relieves and shortens it; it is not debilitating; it removes, in a few minutes, a quantity of fluid which could not be removed through the skin, kidneys and bowels, in many hours, days or

even weeks; and it does all this without causing weakness and slow recovery; it prevents that carnification of the lung and those tender adhesions which in late aspiration eventuate in deformity of the chest and hæmorrhage into the pleural cavity; it prevents congestion of the lung on the unaffected side, and injurious dilatation of the right ventricle; it probably secures exemption from empyema in many cases; and if it be true that in quite a large percentage of cases, pleuritis is tubercular, then this treatment, like the prompt removal of the fluid in tubercular ascites, is decidedly the most efficacious in preventing or arresting general bacillary infection. In short, it averts death, and safely, easily, promptly and permanently cures the patient.

DISCUSSION.

DR. CHARLES J. FOOTE (New Haven): I am very glad the subject has been brought before the Association, because the general practitioner sees a great many cases of pleurisy that have been untreated. The pleurisy comes on in an insidious way, and the patient goes for weeks with a large effusion. The danger arises from the fact that we don't know how long it takes to bind down a lung so that it will not expand.

I have no doubt that many cases of pleurisy are crippled for life, with curvature of the spine and a contracted chest, just because the effusion was allowed to remain until the lung was bound down by adhesions and could not expand. I think the general practitioner sees many of these cases, and sees the need of an early diagnosis, and of removing the cause as speedily as possible. A great many effusions seem to go away of themselves very quickly, or with very simple treatment.

In reading over the causes of pleurisy, we find tuberculosis, pneumonia and streptococcus infection are the most common causes. But, after all, it seems to me I have seen a good many cases that have occurred in rheumatism. Inflammatory rheumatism quite often causes pleurisy. I see no reason why that should not be so. The serous membranes are very similar to the membrane of the joints, and I cannot see why an effusion in the pleural cavity should not be absorbed as quickly as effusions in the knee joint, for instance, and amenable to the same treatment. I think a great many of them do disappear under treatment, where the cause is of rheumatic origin. But in case the effusion does not go away, I think tapping ought to be resorted to.

DR. GEORGE BLUMER (New Haven): Just two or three points I would like to speak about. In the first place, in connection with the physical signs, I disagree with the statement that egophony is an unimportant sign. I think it is one of the most important signs of pleural effusion, very common in pleural effusion, and very uncommon in lobar pneumonia.

Then with regard to tapping; I think it is a very doubtful question whether tapping ought to be done in every case of pleurisy. I have certainly seen a number of cases, and I know of others who have had a similar experience, in which patients who were tapped apparently seemed more liable, as far as one could judge, to come back some months afterwards with signs of pulmonary tuberculosis; rather more apt to do so than patients who were not tapped. So that while I think tapping is absolutely demanded in a certain number of cases, especially in cases of very large effusion, where the compression of the lung is great, it certainly should not be done indiscriminately and without, especially in the smaller effusions, trying other ordinary measures. In connection with tapping I would call attention to a treatment advocated, I believe, first by Sir James Barr of Liverpool, of introducing, either previous to tapping or at the time of tapping, fifteen or twenty drops of adrenalin, 1 to 1,000 solution. I have tried both methods, introducing the adrenalin into the effusion a day or two before the tapping, and introducing it at the time of the tapping. I don't know that I have observed any particular difference in the way it acts given in the two ways. It does seem to me that fluid is rather less likely to accumulate if adrenalin is used than if you simply perform tapping.

Then, as to the tubercular nature of these cases; there was a paper I recall published some five or six years ago, by Hodenpyl of New York, showing that in quite a large per cent. of individuals who come to autopsy, and who are entirely free from signs of pulmonary tuberculosis, there exist on the pleura, generally on the visceral pleura, small nodules, which for a great many years were described by pathologists as fibromata. Hodenpyl's work, and it was afterwards repeated by Lartigau and myself, showed that these are not fibromata at all—they are tubercles. The earlier ones of course were definitely tubercular. A great many of them undergo fibroid transformation. The fact remains that then, after undergoing fibroid transformation, a great many of these small nodules contain tubercle bacilli, and are capable of setting up tuberculosis when inoculated into animals. These observations show how easy it is for an individual to contract tuberculous pleurisy; like an individual who is carrying around pneumococci in his mouth all the time, he is carrying with him the necessary germs to set up pleurisy when the resistance is lowered. Then the tuberculous nature of a great many of these pleurisies can be demonstrated by using opthalgo-tuberculin, introducing a drop into the eye and getting a marked reaction.

PAPERS READ AT COUNTY
MEETINGS

Papers Read at County Meetings.

HARTFORD COUNTY.

October 22, 1907.

ADDRESS BY THE PRESIDENT.

Urban versus Suburban Sanitation, . . . Dr. Edward K. Root.

PAPERS AND DISCUSSIONS.

Chloroform Anæsthesia, . . . Dr. Thomas G. Sloan.

Discussion, . . . Dr. Orrin R. Witter.

Cerebral Paralysis with Report of Two Cases, Dr. John L. Bridge.

Discussion, . . . Dr. Allen H. Williams.

Unusual Cause of Vesical Calculus with Report of Case,
Dr. Arvid Anderson.

Discussion, . . . Dr. Thomas E. Reeks.

CLINICAL CASES.

Case of Hydrophobia, . . . Dr. Michael R. Laden.

Discussion, Dr. William Porter, Jr., Dr. Arthur J. Wolff and
Dr. Frederick T. Simpson.

April 7, 1908.

PAPERS AND DISCUSSIONS.

Acute Articular Rheumatism, . . . Dr. J. F. Dowling.

Discussion, . . . Dr. T. S. O'Connell, Dr. C. A. Goodrich.

Fibroid Tumors of the Uterus, . . . Dr. P. H. Ingalls.

Discussion, . . . Dr. A. J. Wolff, Dr. O. C. Smith.

The Menace of the Facial Tonsil, . . . Dr. M. S. Bradley.

Discussion, . . . Dr. W. H. Fitzgerald, Dr. F. S. Crossfield.

NEW HAVEN COUNTY.

October 24, 1907.

THE ART OF MEDICATION.

I. How it is Lost, . . . Dr. A. A. Crane.

II. The Viewpoint of the Druggist, Mr. W. A. Spalding.

III. How it can be Acquired, . . . Dr. O. T. Osborne.

DISSERTATIONS.

Dr. W. J. Delaney.

Dr. P. D. Littlejohn.

Dr. Albert Von Tobel.

VOLUNTARY PAPER.

Results of Milk Inspection in New Haven, Dr. D. M. Lewis.

April 23, 1908.

CYSTITIS.

- I. Etiology and Pathology, Dr. H. G. Anderson.
- II. Medical Treatment, Dr. F. H. Reilly.
- III. Surgical Treatment, Dr. Edward L. Keyes, Jr., New York City.

DISSERTATIONS.

- The Surgical Treatment of Empyema, . . . Dr. P. T. O'Connor.
- Case of Renal Calculus, Dr. B. Austin Cheney.

NEW LONDON COUNTY.

October 3, 1907.

DISSERTATIONS.

- Popular Nostrum and Ethical Nostrum Evils (What the American Physician can do toward their Suppression and Elimination).

Dr. E. P. Douglass.

- Sarcoma of the Kidney in Children, . . . Dr. Leon LaPierre.

April 2, 1908.

READING OF ANNUAL DISSERTATION.

- Opsonins, and their Relation to Immunity, . . . Dr. C. B. Graves.

FAIRFIELD COUNTY.

October 8, 1907.

READING OF PAPERS.

- Surgery of the Gall Bladder and Biliary Ducts,
Dr. Charles H. Peck, New York City.
- Traumatic Neurotics, Medico-Legal Aspect, Dr. Nathaniel Selleck.
- Prophylaxis of Tuberculosis, . . . Dr. Charles N. Haskell.

April 14, 1908.

READING OF PAPERS.

- Some Observations upon Acute Unilateral Hæmatogenous Infections of the Kidney, . . Dr. George Emerson Brewer, New York City.
- Traumatic Neurotics, Medico-Legal Aspect, Dr. Nathaniel Selleck.
- Cardiac Involvement of Acute Rheumatism, Dr. Daniel M. Driscoll.

WINDHAM COUNTY.

October 31, 1907.

PAPER.

- What shall be done in Dysuria of the Male? . . Dr. S. B. Overlock.

VOLUNTARY PAPER.

- The Work of the Sanatorium as a Preventative and Cure of Tuberculosis, and the Needs of our State along this Line,

Dr. D. R. Lyman, Supt. Gaylord Farm Sanatorium, Wallingford.

PAPER.

- Atropine, Dr. George M. Burroughs.

April 23, 1908.

VOLUNTARY PAPER.

Diagnosis of Impetigo Contagiosa, . . . Dr. J. L. Gardner.
ADDRESS ON BACTERIOLOGY, ETC.

Prof. H. W. Conn, Wesleyan University, Middletown, Bacteriologist
to the State Board of Health.

SPECIAL PAPER.

The Present State of Stomach Surgery, with Special Reference to
Gastric and Duodenal Ulcer, . . . Dr. John B. Boucher.

LITCHFIELD COUNTY.

October 8, 1907.

PAPERS BY MEMBERS OF THE ASSOCIATION.

I. Embolism of the Femoral Artery following Typhoid Fever,
Dr. John Geikie Adam.

II. Chronic Invalidism, . . . Dr. George H. Wright.

PAPERS BY INVITED GUESTS.

I. Diabetes, . . . Dr. Oliver T. Osborne.

II. From Practical Point Diagnosis of Appendicitis: Indications
for Operation Based on the Observation of Six Hundred
Cases, . . . Dr. Charles H. Richardson.

III. Early Diagnosis of Tuberculosis, . . . Dr. Carl E. Munger.

April 28, 1908.

PAPERS BY MEMBERS OF THE ASSOCIATION.

I. Mycosis Fungoides, . . . Dr. Francis S. Skiff.

II. Was it Appendicitis? . . . Dr. J. C. Kendall.

PAPERS BY INVITED GUESTS.

I. The Treatment of Chronic Bright's Disease,
Reynold Webb Wilcox, M.D., LL.D., Professor of Medicine,
New York Post-Graduate Medical School and Hospital.

II. Paralysis: Its Mechanical and Operative Treatment,
Dr. James C. Wilson.

III. Liquid Air in Dermatology, . . . Dr. James Douglass Gold.

MIDDLESEX COUNTY.

October 10, 1907.

DISCUSSION.

Pneumonia, . . . Leaders: Drs. M. C. Hazen, F. E. Potter and
C. E. Stanley.

CLINICAL REPORTS.

I. A Case of Renal Calculus, . . . Dr. E. G. Rowland.

II. Notes on Morphinism, Hysteria and Dementia Precox,
Dr. F. K. Hallock.

III. Notes on Parotitis, . . . Dr. H. T. French.

April 9, 1908.

PAPERS.

- I. The Present Psycho-therapeutic Movement, Dr. F. K. Hallock.
- II. Calmette's Ocular Reaction. A Résumé of its Literature,
Dr. F. B. Bradeen.
- III. Opsonins, Dr. F. T. Fitch.
- IV. Etiology of Leptomeningitis, Dr. Irwin Grannis.
- V. The Rôle of Alcoholic Excesses in the Causation of Mental
Diseases, Dr. J. M. Keniston.

TOLLAND COUNTY.

October 15, 1907.

PAPERS.

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| Fractures of the Lower Extremities, . . . | Dr. C. B. Newton. |
| Medical Legislation, | Dr. W. L. Higgins. |
| Intestinal Obstruction, | Dr. P. Cassidy. |
| An Epidemic of Appendicitis, | Dr. E. T. Davis. |
| Nasal Catarrh and Reflexes, | Dr. E. O. Winship. |
| The Opsonic Theory, | Dr. C. W. Weidner. |
| Medical Treatment of Gall Stone Cases, . . . | Dr. E. P. Flint. |
| The Ideal Physician, | Dr. D. J. Shahan. |

April 21, 1908.

PAPERS.

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| Severe Injury to Hand, | President. |
| Diseases of the Respiratory Organs—Air Borne, . . . | Dr. C. B. Newton. |

SPECIAL PAPERS.

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| Leprosy, | Dr. J. B. Fiske. |
| Electricity and the General Practitioner, . . . | Dr. C. E. Simonds. |
| Congenital Transposition of Viscera, with Report of a Case,
Dr. C. E. Pendleton. | |
| The Unusual in One Thousand Labor Cases, . . . | Dr. F. L. Smith. |
| Short Talk on Obstetrics, | Dr. James Stretch. |

OBITUARIES

Seneca D. Powell, M.D., LL.D., Greenwich.

Dr. Powell died at his home in Greenwich, Conn., on August 24, 1907, in his sixtieth year. He was born in Wilcox County, Alabama. He was of colonial descent; his ancestors were from South Carolina. Dr. Powell was a cadet in the University of Alabama at the outbreak of the Civil War, when he was in his fifteenth year. He soon entered the service of the southern army and served until the end of the war, when he began the study of medicine and was graduated from the University of Virginia in 1869. Dr. Powell then came to New York and was graduated in medicine from the University of the City of New York in 1870. He served a year and a half on the house staff of Bellevue Hospital. In 1871-72 he was an assistant inspector of the Board of Health, and also an assistant to the professor of medicine in Bellevue Hospital Medical College.

He soon became chief assistant to the late Prof. James L. Little in the University Medical College, and held that position until Dr. Little accepted the chair of surgery in the Post-Graduate Medical School in 1882, when he followed his chief. In the latter named institution Dr. Powell was for some years instructor in surgical dressings, then professor of minor surgery and finally of clinical surgery, which position he held until his resignation in 1905. Dr. Powell was also secretary of the Post-Graduate Faculty from 1897 to 1903. He was president of the Medical Society of the County of New York in 1893, and of the Medical Society of the state in 1897-98.

Dr. Powell was one of the best teachers in surgery, especially of minor surgery, that we have ever had in this country. He had a fine personality, was courteous and genial in his manners, facile and witty in social life, and a very great favorite. He made his mark in antiseptic surgery by his exploitation of the virtues of carbolic acid, and perhaps was

the very first to show the efficacy of alcohol as an antidote to this drug. He was also greatly interested in the surgery of the skull for the relief of cerebral disease, especially idiocy. Dr. Powell contributed many interesting cases to the medical journals, especially the *Post-Graduate*. It is greatly to be deplored that he did not present his views and experiences on certain surgical subjects in a succinct form.

Dr. Powell resigned from the *Post-Graduate* in 1905 on account of failing health, and he has not been in practice for three years. He was twice married, first to a daughter of the late Robert Irwin, Esquire, of this city. By this marriage he had one son, Irwin Powell, who died a few months before his father in the vigor of youthful manhood. In 1889 Dr. Powell was married to Isabelle V. Wilson, who, with twin daughters, Emily and Isabelle, survives him.

Dr. Powell was elected a director of the Post-Graduate School in 1890, and served in that capacity until his resignation as a professor, when he gave up his directorship. The school owes much of its success to his skill and popularity in the days of his active work. He was a child of the school, having begun work with it in its infancy and having been actively connected with it for twenty-three years.—From *The Post-Graduate*, XXII, 1909, pp. 981-982.

He was elected an honorary member, from New York City, of the Connecticut State Medical Society in 1901.

Adrian Theodore Woodward, M.D., Brandon, Vt.

CHARLES W. PECK, M.D., BRANDON, VT.

Dr. Adrian Theodore Woodward, the object of our sketch, was born in Castleton, Vt., July 17, 1827, the son of Dr. and Mrs. Theodore Woodward. At the tender age of thirteen he was a fatherless boy apprenticed to his brother-in-law, with the understanding that he was to earn what he could in a drug store, have a college education, study medicine and become a doctor. This arrangement was changed and at the age of seventeen he was flung almost entirely upon his own resources, with few friends and less money. When eighteen years old he left school and began the study of medicine, particularly anatomy, for which he developed a great fondness, spending all his spare time in the study of comparative anatomy and dissecting many of the lower order of animals. He graduated in medicine and surgery at the Castleton Medical College in the fall of 1847, and at twenty, without money or friends, he began the practice of his profession at Whitehall, N. Y., where he remained four years. He was married at twenty-two years of age to Miss Martha Chapin, who lived only two years. The last year of his residence at Whitehall he spent much of his time as demonstrator of anatomy at the Albany Medical College, which really was the foundation of his surgical work in after years. At twenty-three years of age he returned to Castleton, where he resumed the practice of his profession, which would have proved a failure had it not been for his acuteness in diagnosing a case of smallpox which had been overlooked by his medical associates. This brought him to the attention of the community and gave him business and money enough to purchase a horse and carriage, the first he had ever owned. The next ray of hope came to him in a surgical way when he performed an amputation

successfully at the hip joint against the counsel of the college faculty, thus establishing his reputation for courage and skill as a surgeon. His next achievement was in a diagnosis, against the combined opinions of the college faculty, in a case of malignant growth in a young girl, which was so characteristic of his ability in after life. In 1855 he was made professor of obstetrics and diseases of women in the medical school at Castleton, a position which he filled with distinction for six years, or until the breaking out of the Civil War.

He was the first professor in this country to give a course of lectures on the diseases peculiar to women in the non-puerperal state.

In 1855 he married Miss Lois Cornelia June of Brandon, Vt., to which place he moved in 1859. Two sons were the result of this union: Julius Hayden, who, after graduating at Cornell University and the College of Physicians and Surgeons of New York City and the University of Vermont, holding a professorship in that school for eleven years and studying abroad, is now a specialist in New York City of the eye, ear, nose and throat. Irving, the second son, died in his boyhood.

In 1863 he was made surgeon of the 14th Vermont Regiment and in the War of the Rebellion was among the most active surgeons at the battle of Gettysburg, winning many compliments for himself and his state for his fine surgical work and great endurance through the three days' fighting. After serving by special appointment as surgeon at the battle of Spottsylvania, he returned on account of poor health to his home and private practice, where he made a specialty of surgical diseases of women.

He was the first surgeon to perform laparotomy in Vermont and a pioneer in other lines of surgery and gynecology. From 1876 to 1890 he occupied the chair of surgical diseases of women in the Medical Department of the University of Vermont. In 1890 he resigned this professorship on account of ill health.

He was a bold operator, a brilliant diagnostician and an indefatigable worker. In a large degree he possessed the

attributes of genius and to his enthusiasm for his profession he sacrificed his health. His was a masterful mind, that made an indelible impress upon the medical thought of his time.

Dr. Woodward was a Mason, an Odd Fellow and a member of the Loyal Legion. He had been president of the Vermont State Medical Society and of the Rutland County Medical and Surgical Society. He had also held the office of Surgeon-General of the Vermont G. A. R.

As far back as 1857 Middlebury College conferred upon him the honorary degree of A.M.

Dr. Woodward was not only respected by his Brandon neighbors for his eminent professional talents, but was esteemed as well for his many sterling qualities as a citizen. He was keenly interested in the welfare of Brandon and her people, and during the years of his active practice no citizen was too poor to claim his services. He died at Brandon, January 9, 1908, at the ripe old age of 80 years, where he leaves a large circle of friends to mourn his loss.

He was elected an honorary member of the Connecticut State Medical Society in 1868.

Warren Russell Davis, M.D., Voluntown.

GEORGE H. JENNINGS, M.D., JEWETT CITY.

Warren Russell Davis, M.D., was born in Palmyra, Maine, June 20, 1838, and died in Roxbury, Mass., October 11, 1907, in the seventieth year of his age.

Dr. Davis' parents were of English and Irish descent. He came of a sturdy race. To Obed Davis and Harriet (Webber) Davis were born thirteen children, of whom Dr. Davis was the youngest child. The home was on a rugged New England farm and here the boyhood of the doctor was spent. When of suitable age to be useful, there were long days of hard work on the farm in the summer; in the winter the district school.

There was a strong desire in this country boy for a better education than the district school afforded; at the age of fifteen he entered St. Albans Academy and later Carina Academy. After the academy life came eight years of teaching school in winter and working on the farm in summer, until enough money had been earned to enable him to start on his chosen profession, the study of medicine. He entered the Harvard Medical School, where he remained a year. A fire at his boarding place destroyed all his property at this time, and he was obliged to leave school to earn the necessary money to complete his medical studies. He later entered the Vermont University, graduating in 1882.

Dr. Davis began the practice of medicine in Exeter, N. H., where he remained two years. From Exeter he removed to Canterbury, Conn., where he remained until 1888, going from this place to Voluntown, Conn., where he continued in active practice until forced by ill health to give up work, after rounding out twenty-five years of hard work as a country practitioner. The field covered by the doctor's practice extended

into towns adjoining Voluntown, frequently reaching even into the state of Rhode Island. Long, tedious rides were common, but these calls were cheerfully met in any weather and by night or day. Though the doctor's health began to fail in March, 1906, he continued his work at intervals until within a few months of his death. He literally "died in harness."

A severe attack of grip in the spring of 1906 was the beginning of the long illness. Overwork at this time brought on heart trouble, severe palpitation of the heart following the slightest exertion. A few months later cancer of the liver was discovered. This progressed steadily until the final release came in October of the following year.

Most of the time of ill health was spent at his home, where old patients often called to offer sympathy and still seek advice from their family doctor. Two months before the end came, he yielded to the wishes of his family and was taken to the Roxbury Hospital, where it was thought better care could be given him. He was a patient sufferer, rarely speaking of his condition except in the most hopeful manner. He was deeply attached to his family and anxious for their welfare, yet ready and willing to lay aside the well-worn garment and pass onward to the wider field that was before him.

Dr. Davis served as health officer in Voluntown for a number of years. In politics he was a Republican, though never an office seeker. He was a member of the Masonic fraternity, and a regular attendant of the Baptist church, though not a member.

Dr. Davis married Annie S. Rines of Palmyra, Maine, in 1868. To them were born two sons, Herbert S. and Albert L. The widow and both sons now reside in Portland, Maine.

William Jedediah Ford, M.D., Washington.

CHARLES I. PAGE, M.D., LITCHFIELD.

Dr. William Jedediah Ford was born in Washington, Conn., April 4, 1850, and died in the same town March 27, 1908. He was the son of Charles Lewis and Mary Calhoun Ford. He came of old New England ancestry, being descended on his father's side from Samuel Ford of Milford, and on his mother's side from Jedediah and Jane Patterson Ford of Cornwall, Conn.

Dr. Ford received his education at the Gunnery, Washington; the Connecticut Literary Institute, Suffield, and the Litchfield Institute, and was graduated from the medical department of the University of New York on March 11, 1884. Before taking up the study of medicine he was engaged in various mercantile enterprises.

Dr. Ford was married on October 6, 1875, to Isabel Brinsmade of Washington.

In 1882 he acquired an interest in the village drug store and remained in the firm until his death. After his graduation he returned to Washington, intending to dispose of his business and take up the practice of medicine in New York state, but during this interval his local practice grew to such an extent that he yielded to the wishes of his friends and decided to locate permanently in his native town. In 1903, feeling the need of help in an exacting country practice, he obtained the assistance of Frederic W. Wersebe, who was associated with him until his death.

I am indebted to the *Hartford Times* for the following:

"Dr. William J. Ford, who dropped off suddenly at Washington in Litchfield County to-day, was the sort of man whom to know is to love. He was the ideal country doctor. Skilled in his profession, anxious to relieve suffering, modest and gentle

as a child, he had a winning personality. He was the friend of the whole community; the whole community was a friend of his. He radiated hope, good cheer, sunshine. He believed in the helpful hand, the kindly smile, the pleasant word. Throughout the wide territory in which he ministered Dr. Ford was known by all and welcomed by everyone. In a rare degree he won and held the confidence of the people among whom he moved. Not sordid and narrow, but unselfish, broad and useful was the life he lived. Born in the town in which he lived and died, he was a familiar figure in the village and on the country roads and he knew his Washington thoroughly. He was a close friend of the late Orville H. Platt, and when the eminent statesman spent his summers in the town of Washington, it was his regular habit to get into Dr. Ford's carriage and drive with the doctor on his professional rounds. The companionship of the two men was intimate and mutually stimulating.

"Dr. Ford loved books and folks and Connecticut. Not a seeker of public office, he was not the type of man to refuse to respond to a civic call. In 1903 he ably represented his town in the House of Representatives. From 1903 to 1905 he served on the State Reformatory Commission with distinction, and he took a deep and abiding interest in the perplexing problems which that body was trying to help solve. He held other positions of public honor.

"Dr. Ford stood for the high and enduring things of life. The tinsel and the glamour did not attract him. He had no use for sham or cant or dress. Service and friendship were the keynotes of his career. The summary ending of his rich and useful life, in obedience to a summons which no man may disregard or evade, will carry sorrow to many hearts and grief into many homes."

Arthur D. Hayes, M.D., Hartford.

CHARLES E. TAFT, M.D., HARTFORD.

Dr. Arthur D. Hayes was born on the seventh day of November, 1868, in Evansville, N. Y. He obtained his early education in the grammar and high schools of Watertown, N. Y. He subsequently studied shorthand and worked as a stenographer in various business houses until he obtained sufficient capital to study medicine. He then took up the study of medicine.

After graduating from the Dartmouth Medical School, he secured a position as physician on the House Staff of the City Hospital at Lynn, Mass., thoroughly enjoying the work and serving with great credit to himself.

Dr. Hayes came to Hartford in September, 1897, and remained in general practice until his last illness.

On November 25, 1903, he married Margaret B. Lee of Hartford, who still survives him. Dr. Hayes was a member of the Hartford City Medical Society, of the County Medical Society and of the Connecticut State Medical Society, and for the past two years has been examiner for the John Hancock Insurance Company. He joined the Hartford City Medical Society in 1900 and for the past two years of his life served most efficiently as its Secretary.

He was unusually interested in his work. His studious habits, his manifest desire to do right by everyone and his willingness to work for others, often at the expense of his own health, won the confidence of his associates. Close attention to his work, together with frequent digestive disturbances and an operation for empyema, which was performed three years ago next March and from which he never fully recovered, undermined his health and proved the predestined cause of tuberculosis, which followed a severe attack of bronchial pneumonia.

Hoping a change might prove beneficial, he spent the winter in Florida, but he returned home much weaker. He died June 17, 1907.

Besides his wife, Dr. Hayes is survived by his mother, two sisters and two brothers.

George James Holmes, M.D., New Britain.

HERMAN STROSSER, M.D., NEW BRITAIN.

Dr. George J. Holmes was born in Griswold, Conn., on February 27, 1854, the son of George Holmes and Amanda Palmer Holmes.

He received his preliminary education in his native town, afterwards entering the high school in Albany, N. Y., from where he graduated, and then commenced the study of medicine at the Albany Medical School, from which he received his diploma in 1882.

Dr. Holmes then commenced general practice in New Britain, Conn., and lived there up to the time of his death.

He joined the State Medical Association in 1883 and has been a member all his lifetime.

After about ten years of general practice, he went to New York and attended a post-graduate course in the eye, ear, nose and throat department of the New York Polyclinic and Hospital, after which he established himself as a specialist in this line in New Britain.

Recognizing the value of a local medical society as a means to unite the profession in New Britain and further the interests of the physicians and public alike, he personally canvassed all the regular physicians in the city, to enlist their coöperation and sympathy toward the establishment of a local medical society. He was successful in inducing a sufficient number of physicians to coöperate with him and the New Britain Medical Society was started in 1892.

When the New Britain General Hospital was started, he was enthusiastically interested in the project, and served up to the time of his death as ophthalmic surgeon on its staff.

Born of revolutionary stock, he was a member of the Connecticut branch of the Sons of the American Revolution and always manifested his interests in this society.

Dr. Holmes was a member of the First Baptist Church of New Britain.

In December, 1907, he suffered from an attack of influenza, which developed into pneumonia, necessitating his removal to the New Britain General Hospital, where he died on the fourteenth day of December, 1907, fifty-three years, nine months and seventeen days old, and he was buried in Fairview Cemetery on the sixteenth day of December, 1907.

Julian LaPierre, M.D., Norwich.

WM. WITTER, M.D., NORWICH.

Julian LaPierre, M.D., died October 21, 1907, at Norwich, having been engaged in the practice of medicine for thirty-six years. He was the son of Arnaud and Sarah (Rathbone) LaPierre. Julian LaPierre was born in Norwich, on June 1, 1844. He was educated in the public schools of Norwich, at Eastman's College, Poughkeepsie, and began the study of medicine in 1868, under the preceptorship of Dr. Samuel E. Maynard.

He attended one course of lectures at Bowdoin Medical College, Brunswick, Maine, and later studied for two years at Bellevue Hospital Medical College, from which he graduated March 1, 1871.

Dr. LaPierre began the practice of medicine in Montville, Conn., in 1871, moved to Columbia, Conn., in 1874, and to Norwich in 1880, where he continued in active practice until his death.

He was a member of the Norwich Medical Society, President in 1892; of the New London County Medical Association, President in 1895; of the Connecticut Medical Society, Assistant Secretary in 1893; of the Association of Military Surgeons of the United States and of the Ancient Free and Accepted Masons.

Dr. LaPierre was appointed a visiting physician to the W. W. Backus Hospital in 1893 and continued as such to the time of his death. Among the last medical services which he performed were those for the hospital.

During his entire life he took an active interest in medical organizations and few in his vicinity could equal him in constant attendance.

All duties assigned him were performed with painstaking care. Dr. LaPierre took an active interest in military affairs.

In 1889 he was appointed assistant surgeon to the Third Regiment, Connecticut National Guard, and promoted to surgeon in 1891. Upon the outbreak of the Spanish War he was mustered into service as major and surgeon of his regiment. He continued in service until October, 1898, when he resigned on account of ill health.

Dr. LaPierre throughout his life was a typical general practitioner, a family physician. In his practice he depended upon rational, well-tried methods, believing that success depended upon the real benefit which the patient secured. Quiet and almost reserved in his speech and manner, a man of few words, when his opinion and advice were given there went with them a certain force which commanded respect.

Conservative, conscientious, painstaking and patient in his treatment of disease, he gradually secured a lucrative practice, which continued up to the time of his death.

Dr. LaPierre was strictly ethical in his relations with his brother physicians, and throughout his life he seemed in some manner to avoid the little disagreeable incidents which sometimes occur between physicians. He had many friends and few enemies.

Although deliberate and slow in reaching conclusions, he was firm in his decisions and persistent in carrying them out. His decision once reached as to what was the right course to pursue, he earnestly worked on without regard for friend or foe. Always earnest in his convictions, gentlemanly in his conduct, he commanded the respect of his opponents.

Dr. LaPierre was an earnest student throughout his life. He early began to acquire a library and this intense interest in books continued until his death. In the *Transactions of the Connecticut Medical Society* two of Dr. LaPierre's articles appeared: "The Phenomenon of Suicide," 1888, "The Conception of Our State Society," 1893.

He was married in 1875 to Miss Eva Browne, elder daughter of James Lanman and Elizabeth Emerson Browne, at Richland Centre, Wisc. Two children, Aubrey and Etienne, died in infancy. His wife and one child, Julian, survive him.

Edward Payson Nichols, M.D., Killingworth.

MINER C. HAZEN, M.D., HADDAM.

Dr. Edward Payson Nichols, the son of Aaron and Elizabeth (Ogden) Nichols, was born at Newark, N. J., November 23, 1827, and died at Killingworth, September 2, 1907. He graduated at Princeton University in 1848 and at the College of Physicians and Surgeons, New York City, in 1852.

Dr. Nichols was one of several volunteer surgeons who were sent by the Governor of New Jersey to the South during the Civil War. In 1865 he was in charge of the United States Hospital at the foot of Centre Street, Newark, where disabled soldiers were sent for treatment. After practising his profession in Newark until 1881, he moved with his family to Killingworth, where he practised according to his ability and enjoyed the quiet of the country, being especially fond of horticulture.

Dr. Nichols was a Mason of Knight Templar degree. He was an active and useful member of the School Board and was interested and active in the promotion of every good enterprise. He represented the town in the Legislature in 1898.

He was married to Mary E. Clark of Hartford in 1854, by whom he had one child, Edward C. Nichols, who survives him and is the town clerk of Killingworth.

Dr. Nichols was a man full of good works, living happily the simple, useful life of the country doctor, in communion with Nature and Nature's God. He was a fine singer and his sweet tenor voice was heard in the old sanctuary at all the gatherings of the worshippers, who sadly miss the aid he afforded in this direction. He was a modest, just man, a Christian gentleman who faithfully served his day and generation according to the will of God and, like a shock of corn fully ripe, was gathered to his fathers.

William J. O'Neil, M.D., New London.

ABIEL W. NELSON, M.D., NEW LONDON.

Dr. William Joseph O'Neil, son of Jeremiah and Mary O'Neil, was born at Elmira, N. Y., January 1, 1873. Educated in the public schools of that city, he graduated at the age of twenty-one at Long Island Medical College, Brooklyn, N. Y.

That year, 1894, coming casually to New London, he was moved to set up in practice. Of gentlemanly bearing, correct habits, courageous, attentive and urgent in business, in the midst of a large Catholic population, being of that faith, he soon had a good clientage. Having a dry, kindly humor and many good stories, he made friends. He drove a pair which without doubt was profitable to him business-wise. He was successful. He took the general line and midwifery, without major surgery, with rather a liking for the eye and ear. About two years before his fatal sickness, he took courses at Philadelphia on the eye and ear, and after that attended specially to that part of his profession, but he had not time to build up in it a great following.

He was fond of horses and games; he liked baseball and was a good player at amateur games of his brother physicians, and occasionally gave an afternoon to the professionals here. It did not, however, stand in the way of work and patients.

October 21, 1901, he married Agnes Patricia, daughter of Patrick and Mary Sheridan of New London. He purchased the house No. 43 Jay Street after his marriage and lived there until his death. He was a member of the city and state medical societies.

He became a victim of sarcoma in 1906. It was extirpated early in 1907, followed by general infection and death on November 21, 1907.

He was about six feet, straight and well proportioned, with dark eyes, thick brown hair, rather full and regular

features, smooth face and of very deliberate speech and movement.

Mrs. O'Neil and a son, his father and mother, two brothers and a sister survive him. Frank O'Neil, a brother, is a physician in Midland, Md.

George Rubens Shepherd, M.D., Hartford.

FREDERICK T. SIMPSON, M.D., HARTFORD.

Dr. George Rubens Shepherd was a man illustrating in himself the finest qualities of humanity, and these qualities were so patent and so genuine that early in life and throughout his life he was elected to fill the highest positions of trust and responsibility.

Dr. Shepherd came of distinguished ancestry, which has been traced back through more than three centuries. In his family line was one John Shepherd, born in England in 1599, who was a brother of one of the founders of Harvard University. A little later came Daniel Shepherd, who served in the French and Indian wars and was with General Wolfe at Quebec. A second Daniel Shepherd followed, who served in the Revolutionary War and was at the battles of Preston and of Bennington. Next was Forrest Shepherd, father of Dr. Shepherd, born in 1800 and graduated from Yale College in 1827. He became a geologist and was elected professor of geology at Western Reserve College. He was an explorer, one of the Argonauts of '49 in California. He discovered the first copper mines in Wisconsin and coal deposits in Western Virginia. He married Sophia White Storer, and to them were born three children, two daughters, and a son, the subject of the present sketch.

In this brief résumé we see an inheritance of intelligence, of courage, of enterprise and of devotion to high ideals which was unfolded in the life of Dr. Shepherd in perfect accordance with the natural laws of heredity, and made him what we knew him to be—a gentleman, a good citizen, and a physician of rare efficiency, skill and wisdom.

George Rubens Shepherd was born in New Haven, December 9, 1842. He received his academical training at the

Hopkins Grammar School and at Phillips-Andover Academy, two of the best known preparatory schools in the country. His medical education came from the Yale Medical School, where he was graduated in 1866. Previous to this, he was enrolled during the Rebellion as a medical cadet and served at the Knight General Hospital in New Haven. Here he gained much surgical experience. For three years after graduation, Dr. Shepherd practised medicine in New Haven. During this time, in 1868, he married Miss Helen Frances Peck of Philadelphia.

The following year he moved to Collinsville, Conn., where he lived ten years. Here were born to him four children, two of whom died in infancy, the other two being a son, Forrest, and a daughter, Charlotte, now wife of Marshall Stearns of New York. In Collinsville he quickly secured a large practice. He kept four horses and was sent for in all directions from the surrounding country. Here he received a serious injury in a railroad accident and was obliged to give up his practice and go abroad for several months to recover his health. In 1879, he moved to Hartford, where he lived up to the time of his death—a period of some twenty-eight years.

A physician is by necessity an opportunist. He cannot carve out for himself a career. Opportunity is for him the open door. When the opportunity comes, is he equal to it? Has he the necessary aptitude, capacity, energy, endurance, skill and wisdom? Dr. Shepherd possessed all these qualities in a high degree. His previous life had given the finest training to his natural capacities, and so it happened that almost at once upon coming to Hartford, he entered upon a professional career of large scope and of commanding importance. He belonged to the generation of men who were accustomed to deal with all the forms of disease or injury which befall humanity. Specialization is a distinct advance so far as progress in the healing art is concerned, but it undoubtedly reduces the position and influence of the individual physician in the community. Dr. Shepherd was uniformly successful in

his medical and surgical work, and he soon became the family physician of a large proportion of the most prominent families in Hartford. He was an eminently successful man in his profession, and he owed his success not to a distinguished bearing, or magnetic voice, or to any extraneous hypnotizing physical powers, but rather to his remarkable insight into the nature and causes of the morbid processes going on in his patients, to his unusual skill and fertility in the selection of appropriate remedies, and to his rare devotion of time and strength to the needs of his patients. They were always certain of his attention, of his interest, of his unfailing kindness, of his constant good cheer and encouragement.

In 1881, Dr. Shepherd was elected Medical Director of the Connecticut Mutual Life Insurance Company, an office which he held at the time of his death. That he could successfully fulfill the duties of this office so many years, in addition to his large general practice, was an illustration of his great energy and capacity for work. Among his medical brethren, Dr. Shepherd was always highly regarded and was elected to fill the most important offices within their ranks. He was President of the Hartford Medical Society, Councilor for Hartford County in the State Medical Society, Delegate from Connecticut to the House of Delegates of the American Medical Association, President of the Association of Life Insurance Medical Directors, Lecturer on Life Insurance Medical Examinations at the Yale Medical School; Consulting Physician at the Hartford Hospital, member of the Board of Visitors to the Hartford Retreat for the Insane and member of the Advisory Board of the *Yale Medical Journal*. Dr. Shepherd was a very active member of the Hartford Medical Society and took great interest in its welfare. Largely through his instrumentality, the Society secured its present home—the house and grounds of the Hunt Memorial Building. He has always been one of the Trustees of this building. Throughout his life he was a constant attendant upon the meetings of the Society, wrote many valuable papers and took active part in the discussions.

This partial list of elective medical offices which he filled is indicative of his prominent position in the medical profession and of the highest estimation of his abilities by his fellow-practitioners. He was equally honored by his fellow-men in other walks of life. Thus he was elected Trustee of the Hartford Theological Seminary, member of the Board of School Visitors of Hartford and of the High School Committee. For twenty years he was President of the Hartford Archæological Society. He was the first President of the Hartford Golf Club. In the church he was an active worker, so far as his medical duties permitted. He joined the Centre Church of Hartford by letter in 1879, of which he became a Deacon and a member of the Prudential Committee. Dr. Shepherd was above all a good man, extremely conscientious in the discharge of his duties, and always ready to sacrifice his pleasure to the needs of those about him. He was an ideal husband and father, and his home life was always a happy one.

All these offices which I have mentioned signify little, except as tangible evidence of the qualities, activities and experiences of a human soul. The great thing is that here was a man who was honest, pure, kind-hearted and high-minded, who was faithful and diligent in the exercise of all his powers. It should be an inspiration as well as a delight to recall the life of Dr. George R. Shepherd, as we realize the deeper meaning of that life of service and devotion to human needs.

John Alexander Wade, M.D., Danbury.

HARRIS F. BROWNLEE, M.D., DANBURY.

Dr. John A. Wade was born at Kingston, N. Y., in 1859, attended the public schools of that place, and in 1883 married Miss Euphemia Townsend of Hartsdale, N. Y. For eight years preceding his entry into the medical profession he was engaged in mercantile business. Aspiring to a more satisfying life, he entered Bellevue Medical College, New York City, and was graduated from that institution in 1893. Coming to Danbury the same year, he continued in general practice up to the time of his death, from a long and painful illness, April 11, 1908, age forty-nine.

It is creditable in no small degree that a man having married and settled down for eight years in business, finding that occupation unsatisfying, should qualify and enter an exacting profession, and fill that position acceptably not only to his patients but to the colleagues with whom he associated.

Dr. Wade had a very large and appreciative clientèle. He was a man of infinite kindness; his sympathies were far reaching, and he became well qualified in his profession. My intimate association with his practice for fifteen years afforded me many opportunities of noting the high degree of esteem and affection in which he was held by his patients. He assumed the rôle of the family physician in its most ethical interpretation, ministering to his patients sincerely with all the skill at his command; and be it recorded to his everlasting credit that he never undertook to do things of dangerous character for which some other obtainable man was to his knowledge better qualified. This trait, a symbol of his honesty and integrity, unknown to some ambitious members of our profession, inspired many of his patients with added confidence and his colleagues with greater respect.

His life was replete with kindly deeds and self-sacrifice and he left behind a host of loyal friends.

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TICUT STATE MEDICAL
SOCIETY.

MEMBERS OF THE SOCIETY.

HONORARY MEMBERS.

WILLIAM MCCOLLOM.....	Brooklyn, N. Y.
AGRIPPA NELSON BELL.....	Brooklyn, N. Y.
JOHN SHAW BILLINGS.....	New York City, N. Y.
THOMAS ADDIS EMMETT	New York City, N. Y.
WILLIAM HENRY WELCH.....	Baltimore, Md.
ROBERT FULTON WEIR.....	New York City, N. Y.
SIR JOSEPH LISTER.....	London, England.
EDWARD G. JANEWAY.....	New York City, N. Y.
HON. CHARLES E. GROSS.....	Hartford, Conn.
DAVID WEBSTER.....	New York City, N. Y.
SIR JAMES GRANT.....	Ottawa, Canada.
HENRY O. MARCY.....	Boston, Mass.
T. MITCHELL PRUDDEN.....	New York City, N. Y.
WILLIAM W. KEEN.....	Philadelphia, Penn.
JAMES W. McLANE.....	New York City, N. Y.
FREDERICK HOLME WIGGIN.....	New York City, N. Y.
J. W. S. GOULEY.....	New York City, N. Y.
REYNOLD WEBB WILCOX.....	New York City, N. Y.
WILLIAM OSLER.....	Oxford, England.
GEORGE M. STERNBERG.....	Washington, D. C.
FRANCIS DELAFIELD.....	New York City, N. Y.
WILLIAM T. BULL.....	New York City, N. Y.
MAURICE H. RICHARDSON.....	Boston, Mass.

ACTIVE MEMBERS.

The names of those who have been Presidents are in capitals.

HARTFORD COUNTY.

CHARLES M. WOOSTER, M.D., Tariffville, *President*.

CHARLES D. ALTON, M.D., Hartford, *Vice-President*.

*FREDERICK B. WILLARD, M.D., Hartford, *Secretary and Treasurer*.

Councilor—OLIVER C. SMITH, M.D., Hartford.

Censors—THOMAS F. KANE, M.D. WALTER G. MURPHY, M.D.
EDWARD G. FOX.

Annual Meeting, First Tuesday in April. Semi-Annual Meeting,
Fourth Tuesday in October.

Hartford:

GURDON W. RUSSELL.....	207 Farmington Avenue.
Horace S. Fuller.....	253 Trumbull Street.
Nathan Mayer.....	904 Main Street.
David Crary.....	926 Main Street.
John B. Lewis.....	700 Main Street.
Gustavus P. Davis.....	700 Main Street.
Charles E. Froelich.....	255 Trumbull Street.
Harmon G. Howe.....	137 High Street.
William W. Knight.....	254 Trumbull Street.
Thomas D. Crothers.....	50 Fairfield Avenue.
George L. Parmele.....	36 Pearl Street.
Ellen H. Gladwin.....	705 Asylum Avenue.
SAMUEL B. ST. JOHN.....	68 Pratt Street.
Frederick S. Crossfield.....	75 Pratt Street.
Marcus M. Johnson.....	122 Woodland Street.
William D. Morgan.....	49 Pearl Street.
John F. Axtelle.....	635 Main Street.
George K. Welch.....	103 Pratt Street.
Phineas H. Ingalls.....	49 Pearl Street.
Edward K. Root.....	49 Pearl Street.
Luther A. Davison.....	11 Pratt Street.

* Exempted from taxation.

John Howard.....	391	Trumbull Street.
Charles D. Alton.....	86	Farmington Avenue.
Oliver C. Smith.....	44	High Street.
Joseph E. Root.....	67	Pearl Street.
William Porter, Jr.....	179	Allyn Street.
Frederick T. Simpson.....	122	High Street.
George R. Miller.....	51	Church Street.
Charles C. Beach.....	125	Trumbull Street.
Gideon C. Segur.....	67	Farmington Avenue.
George C. Bailey.....	85	Church Street.
Alva E. Abrams.....	36	Pearl Street.
Charles E. Taft.....	98	High Street.
Thomas F. Kane.....	517	Main Street.
Arthur J. Wolff.....	1	Spring Street.
Ansel G. Cook.....	179	Allyn Street.
Edwin A. Down.....	902	Main Street.
Daniel F. Sullivan.....	64	Church Street.
Joseph H. Cahill.....	1145	Main Street.
Everett J. McKnight.....	110	High Street.
Benjamin S. Barrows.....	189	High Street.
Michael A. Bailey.....	434	Main Street.
George N. Bell.....	44	High Street.
Frank L. Waite.....	68	Pratt Street.
Charles S. Stern.....	75	Pratt Street.
Oliver K. Isham.....	211	High Street.
Franklin L. Lawton.....	295	Main Street.
John H. Rose.....	75	Pratt Street.
John B. Waters.....	281	Trumbull Street.
Joseph B. Hall.....	10	Garden Street.
Edward A. Elmer.....	805	Park Street.
Janet M. Weir.....	282	Sigourney Street.
John F. Dowling.....	1315	Main Street.
Philip D. Bunce.....	98	High Street.
Homer L. Law.....	100	Washington Street.
Wilton E. Dickerman.....	125	Trumbull Street.
John B. Boucher.....	25	Charter Oak Avenue.
Levi B. Cochran.....	43	Farmington Avenue.
James H. Naylor.....	3	Main Street.
Charles P. Botsford.....	1337	Main Street.
James H. Standish.....	340	Windsor Avenue.
Michael H. Gill.....	36	Pearl Street.
John B. McCook.....	390	Main Street.
John W. Felty.....	902	Main Street.
George E. Sleeper.....	1333	Main Street.

Thomas W. Chester.....	110	High Street.
Joseph A. Kilbourn.....	271	Park Street.
Thomas B. Enders.....	3	Highland Street.
Charles A. Goodrich.....	5	Haynes Street.
Alfred M. Rowley.....	53	Main Street.
Irving DeL. Blanchard.....	73	Windsor Avenue.
Emil G. Reinert.....	109	Main Street.
Heman A. Tyler, Jr.....	686	Main Street.
Frederick L. McKee.....	92	Pearl Street.
Edward R. Lampson.....	125	Trumbull Street.
E. Terry Smith.....	36	Pearl Street.
William H. Fitzgerald.....	904	Main Street.
Emma J. Thompson.....	287	Trumbull Street.
Patrick J. Ryan.....	316	Park Street.
Walter R. Steiner.....	4	Trinity Street.
Ellen P. O'Flaherty.....	140	Main Street.
Marian W. Williams.....	748	Asylum Street.
Allen H. Williams.....	904	Main Street.
C. Brewster Brainard.....	904	Garden Street.
Eckley R. Storrs.....	179	Allyn Street.
Ernest A. Wells.....	904	Main Street.
William H. Van Strander.....	73	Church Street.
James W. Conklin.....	89	Pratt Street.
Orrin R. Witter.....	44	High Street.
Michael R. Laden.....	11	Buckingham Street.
*Frederick Buell Willard.....	80	Church Street.
Francis Arthur Emnet.....	1295	Main Street.
Henry Ely Adams.....	148	Church Street.
William T. Owens.....	397	Capitol Avenue.
John C. Pierson.....	50	Windsor Avenue.
Charles Fitzgerald.....	904	Main Street.
Henry F. Stoll.....	75	Pratt Street.
Paul B. Swett.....	179	Allyn Street.
Charles J. Fox.....	36	Pearl Street.
Mark S. Bradley.....	36	Pearl Street.
Harry C. Clifton.....	242	Sigourney Street.
Robert S. Starr.....	75	Pratt Street.
Arthur C. Heublein.....	110	High Street.
Whitefield N. Thompson.....	30	Washington Street.
Annabella K. Davenport.....	38	Collins Street.
Maude W. Taylor.....	75	Pratt Street.
Joseph J. Boucher.....	247	Park Street.
Isaac W. Kingsbury.....	36	Pearl Street.

* Exempted from taxation.

Edward J. Turbett.....	18 New Park Avenue.
Patrick J. McPartland.....	1341 Main Street.
Thomas F. Welch.....	356 Windsor Avenue.
James F. Wilson.....	164 High Street.
Robert L. Rowley.....	904 Main Street.
William H. Crowley.....	15 Charter Oak Avenue.
Horace C. Swan.....	11 Lincoln Street.
Frank J. Ronayne.....	158 High Street.
Otto G. Wiedman.....	377 Albany Avenue.
Thomas N. Hepburn.....	42 High Street.
Henry A. Martelle.....	110 High Street.
Charles T. Beach.....	686 Main Street.
Edward H. Blair.....	389 Main Street.
James W. Ward.....	437 Capitol Avenue.
George F. Vail.....	36 Pearl Street.
Clarence M. Hatheway.....	110 High Street.
Albert R. Keith.....	468 Washington Street.
Joseph P. Ryan.....	44 Church Street.
Arthur H. Griswold.....	108 Church Street.
David J. Molumphy.....	417 Main Street.
Morris Tuch.....	16 Village Street.

Berlin:

Robert E. Ensign.

EAST BERLIN:

Thomas C. Hodgson.

Bristol:

William W. Horton.

Arthur S. Brackett.

William M. Curtis.

Canton—COLLINSVILLE:

George F. Lewis.

Paul Plummer.

Ralph B. Cox.

East Hartford:

Thomas S. O'Connell.

Walter G. Murphy.

Franklin H. Mayberry.

East Windsor—BROAD BROOK:

Howard O. Allen.

Harold S. Backus.

Enfield—THOMPSONVILLE:

Edward F. Parsons.

George T. Finch.

Henry G. Varno.

Michael J. Dowd.

John L. Bridge.

HAZARDVILLE:

Simon W. Houghton.

Granby:

Rollin D. Chatfield.

Glastonbury:

Charles G. Rankin.

William S. Kingsbury.

SOUTH GLASTONBURY:

Henry M. Rising.

Harry B. Rising.

Manchester:

Francis H. Whiton.
Calvin Weidner.

SOUTH MANCHESTER:

William R. Tinker.
Thomas H. Weldon.
William S. Gillman.
Noah A. Burr.
Thomas G. Sloan.

New Britain:

*George Clary.
*Jay S. Stone.
Erastus P. Swasey.
*Michael J. Coholan.
Lawrence M. Cremin.
Samuel W. Irving.
Robert M. Clark.
Hermann Strosser.
Arvid Anderson.
Kenneth E. Kellogg.
Edward L. Whittemore.
Thomas E. Reeks.
William W. Brackett.
Ernst T. Fromen.
Catherine H. Travis.
Theodore G. Wright.
Charles A. Gillin.
Julius Hupert.
Joseph H. Potts.

Newington:

Julius E. Griswold.

Plainville:

John N. Bull.

Rocky Hill:

Orran A. Moser.

Simsbury—TARIFFVILLE:

John P. Carver.
Charles M. Wooster.

Southington:

Willard G. Steadman.
William R. Miller.

South Windsor:

Mary S. Tudor.
Henry A. Deane.

Suffield:

Matthew T. Newton.
Philo W. Street.
William M. Stockwell.
Joseph A. Gibbs.

WEST SUFFIELD:

William E. Caldwell.

West Hartford:

Charles O. Purinton.
*Edwin B. Lyon.
Ralph W. E. Alcott.

Wethersfield:

Edward G. Fox.
Arthur W. Howard.
Felix P. Chillingworth.

Windsor:

Newton S. Bell.
Howard F. King.

Windsor Locks:

Joseph A. Coogan.
William J. Coyle.
Myron P. Robinson.
Richard A. Outtersen.

*Exempted from taxation.

NEW HAVEN COUNTY.

NORTON R. HOTCHKISS, M.D., New Haven, *President*.

WILLIAM J. DELANEY, M.D., Naugatuck, *Vice President*.

*WILLIAM S. BARNES, M.D., New Haven, *Secretary*.

Councilor—CHARLES S. RODMAN, M.D., Waterbury.

Censors—CHARLES J. FOOTE, M.D., F. N. LOOMIS, M.D.,
SAMUEL D. OTIS, M.D.

Annual Meeting, Third Thursday in April; Semi-Annual, Third
Thursday in October.

New Haven:

John Nicoll.....	70	Howe Street.
FRANCIS BACON.....	32	High Street.
A. E. Winchell.....	60	Pearl Street.
Arthur Ruickoldt.....	71	Olive Street.
Frederick Bellosa.....	209	Orange Street.
S. D. Gilbert.....	27	Wall Street.
J. P. C. Foster.....	109	College Street.
W. H. CARMALT.....	87	Elm Street.
T. H. Russell.....	137	Elm Street.
F. H. Whittemore.....	69	Elm Street.
C. P. Lindsley.....	37	Elm Street.
H. Fleischner.....	928	Grand Avenue.
M. Mailhouse.....	45	Elm Street.
M. C. O'Connor.....	882	State Street.
Charles E. Park.....	42	Elm Street.
Gustavus Eliot.....	209	Church Street.
J. F. Stetson.....	106	High Street.
J. F. Luby.....	667	Grand Avenue.
William W. Hawkes.....	35	High Street.
Frank H. Wheeler.....	27	Perkins Street.
Herbert E. Smith.....		Medical College.
F. W. Wright.....	48	Pearl Street.
Edward K. Roberts.....	244	Grand Avenue.
Oliver T. Osborne.....	252	York Street.
Lucy C. Peckham.....	141	Green Street.
William G. Daggett.....	189	Church Street.
Louis S. DeForest.....	335	Orange Street.
Henry L. Swain.....	232	York Street.
Mary B. Moody.....		Sherland Avenue, cor. E. Grand Avenue.

*Exempted from taxation.

G. F. Converse.....	1	Whalley Avenue.
J. H. Townsend.....	39	College Street.
T. M. Cahill.....	40	Pearl Street.
C. J. Foote.....	26	Elm Street.
S. J. Maher.....	212	Orange Street.
Jay W. Seaver.....	25	Lynwood Place.
Louis B. Bishop.....	356	Orange Street.
H. W. Ring.....	187	Church Street.
W. C. Welch.....	44	College Street.
A. O. Baribault.....	528	Chapel Street.
Rollin McNeil.....	149	Bradley Street.
Edward M. McCabe.....	22	Elm Street.
James M. Reilly.....	337	Cedar Street.
Clarence E. Skinner.....	331	Temple Street.
N. R. Hotchkiss.....	219	York Street.
Benjamin A. Cheney.....	40	Elm Street.
Charles A. Tuttle.....	196	York Street.
Harry B. Ferris.....	395	St. Ronan Street.
Leonard W. Bacon, Jr.....	294	Elm Street.
Paul S. Robinson.....	164	Grand Avenue.
Arthur N. Alling.....	257	Church Street.
R. A. McDonnell.....	1142	Chapel Street.
E. P. Pitman.....	52	Sylvan Avenue.
Isaac N. Porter.....	198	Dixwell Avenue.
Ernest H. Arnold.....	46	York Square.
Robert E. Peck.....	56	Howe Street.
William C. Wurttemberg.....	28	Elm Street.
Chauncey S. Lamb.....	776	Howard Avenue.
Frederick N. Sperry.....	42	College Street.
William F. Verdi.....	13	Elm Street.
Charles J. Bartlett.....	209	York Street.
Morris D. Slattery.....	566	Howard Avenue.
Ward H. Sanford.....	60	Edwards Street.
William M. Kenna.....	145	Olive Street.
Leonard C. Sanford.....	347	Temple Street.
Willis H. Crowe.....	106	Whalley Avenue.
Charles H. Robbins.....	326	Grand Avenue.
Louis M. Gompertz.....	1195	Chapel Street.
Alfred G. Nadler.....	377	Orange Street.
William Sprenger.....	366	George Street.
Frederick C. Bishop.....	1223	Chapel Street.
James H. J. Flynn.....	840	Howard Avenue.
Frank A. Kirby.....	235	Dixwell Avenue.
William J. Sheehan.....	619	Howard Avenue.

John F. Sullivan.....	205 Blatchley Avenue.
Edward F. McIntosh.....	192 York Street.
Nicola Mariani.....	119 Greene Street.
James S. Maher.....	215 Orange Street.
Percy D. Littlejohn.....	193 York Street.
A. W. Marsh.....	1012 Whalley Avenue.
William N. Winne.....	58 Harrison Street.
*William S. Barnes.....	526 Howard Avenue.
Clarence L. Kilbourn.....	202 Blatchley Avenue.
Gilbert T. McMaster.....	42 Trumbull Street.
Henry H. Smith.....	43 Elm Street.
Julia E. Teele.....	207 Hamilton Street.
Harry L. Weleh.....	44 College Street.
Otto G. Ramsay.....	251 Church Street.
Francis P. Heery.....	153 Olive Street.
Thomas V. Hynes.....	27 College Street.
Harry M. Steele.....	26 Church Street.
Willis E. Hartshorn.....	1138 Chapel Street.
Richard F. Rand.....	246 Church Street.
Edward S. Moulton.....	38 Elm Street.
Timothy Francis Cohane.....	600 Howard Avenue.
William James Butler.....	712 Howard Avenue.
David Bercinsky.....	360 George Street.
Louis A. Notkins.....	700 Howard Avenue.
Terrence S. McDermott.....	1334 Chapel Street.
David L. Rundlett.....	1543 Chapel Street.
Francis H. Reilly.....	312 Columbus Avenue.
Nelson A. Ludington.....	96 Park Street.
Dwight M. Lewis.....	193 York Street.
Seymour L. Spier.....	348 Crown Street.
William H. Bean.....	252 York Street.
John G. Hugo.....	1245 State Street.
E. Reed Whittemore.....	69 Elm Street.
John E. Lane.....	203 York Street.
Aliee P. Ford.....	1187 Chapel Street.
Francis N. Boynton.....	46 York Square.
Frank B. Standish.....	312 Elm Street.
Carl W. Henze.....	22 Trumbull Street.
Eugene M. Blake.....	257 Church Street.
George Blumer.....	204 York Street.
Archibald C. Herbert.....	159 Elm Street.
Mary P. Dole.....	15 Elm Street.
Treby W. Lyon.....	410 Dixwell Avenue.

*Exempted from taxation.

Harold S. Arnold.....199 York Street.
 Frederick P. Lane.....524 Chapel Street.
 Allen R. Diefendorf.....42 Elm Street.

Ansonia:

Louis E. Cooper.
 Louis H. Wilmot.
 Edward K. Parmelee.

Branford:

C. W. Gaylord.
 A. J. Tenny.

Cheshire:

Edward W. Karrman.

Derby:

F. N. Loomis.
 Royal W. Pinney.
 Edward O'R. Maguire.

East Haven:

Charles W. Holbrook.

Guilford:

George H. Beebe.
 Redfield B. West.

Hamden:

Walter S. Lay.

MOUNT CARMEL:

George H. Joslin.

Madison:

John M. Shepard.
 Milo P. Ringe.

Meriden:

*N. Nickerson.
 A. W. Tracey.
 E. T. Bradstreet.
 J. D. Eggleston.
 Edward W. Smith.
 Ava H. Fenn.
 E. W. Pierce.

S. D. Otis.

F. P. Griswold.

E. D. Hall.

H. W. Delesdernier.

H. A. Meeks.

William Galvin.

J. W. H. La Pointe.

Joseph A. Cooke.

Albert E. Von Tobel.

Louis F. Wheatley.

Michael J. Sullivan.

Howard deF. Lockwood.

Milford:

E. B. Heady.

E. C. Beach.

Naugatuck:

Thomas M. Bull.

James W. Robbins.

William J. Delancy.

Edwin H. Johnson.

Frank J. Tuttle.

John J. Carroll.

Walter A. Reilly.

North Haven:

R. B. Goodyear.

Edwin H. Bidwell.

Gould S. Higgins.

Orange—WEST HAVEN:

J. F. Barnett.

Durrell Shepard.

Charles D. Phelps.

Victor A. Kowalewski.

Charles A. Bevan.

Oxford:

*Lewis Barnes.

*Exempted from taxation.

Seymour:

Frank A. Benedict.
Elias W. Davis.

Wallingford:

J. D. McGaughey.
William S. Russell.
William P. Wilson.
Caroline North.
David R. Lyman.
Irving E. Brainard.

Waterbury:

F. E. Castle.
Walter L. Barber.
CHARLES S. RODMAN.
J. M. Benedict.
Carl E. Munger.
Bernard A. O'Hara.
John F. Hayes.
Augustin A. Crane.
Patrick T. O'Connor.
John D. Freney.
Charles A. Hamilton.
George O. Robbins.
Charles H. Brown.
Edward W. Goodenough.
Myron L. Cooley.
Frederick G. Graves.
John R. Poore.
James L. Moriarty.
George W. Russell.

Daniel L. Maloney.
Thomas J. Kilmartin.
Charles A. Monagan.
Henry G. Anderson.
Henry E. Hungerford.
Nelson A. Pomeroy.
Patrick J. Dwyer.
Louis J. Thibault.
William A. Goodrich.
Adelard D. David.
John E. Farrell.
Charles Engelke.
Willard F. Allen.
Thomas J. McLarney.
Edward F. Ashley.
Dudley B. Deming.
Andrew C. Swenson.
James J. McLinden.
Thomas E. Parker.
Elizabeth C. Spencer.
Michael J. Donahue.
Egbert L. Smith.
John L. Dillon.
John J. Gayley.
Isabel Cowan.
Joseph H. Callbreath.
Arthur Variell.
Aletta L. Bedford.
Theodore F. Bevans.
Harold E. Hoyt.

WATERVILLE:

Walter A. Leonard.

NEW LONDON COUNTY.

HARRY M. LEE, M.D., New London, *President*.

MORTON E. FOX, M.D., Uncasville, *Vice President*.

*EDWIN C. CHIPMAN, M.D., New London, *Secretary*.

Councilor—EDWARD P. BREWER, M.D., Norwich.

Censors—L. S. PADDOCK, M.D., WILLIAM WITTER, M.D.,
C. E. BRAYTON, M.D.

Annual Meeting, First Thursday in April; Semi-Annual, First
Thursday in October.

*Exempted from taxation.

Colchester:

Raymond R. Gandy.

East Lyme—NIANTIC:

Frederick H. Dart.

Edward Atkinson.

Griswold—JEWETT CITY:

George H. Jennings.

Alphonse Fontaine.

Groton:

Edmund P. Douglass.

Frank W. Hewes.

NOANK:

William M. Hill.

Montville—UNCASVILLE:

Morton E. Fox.

New London:

Abiel W. Nelson.

FRANCIS N. BRAMAN.

John G. Stanton.

Charles B. Graves.

Harold H. Heyer.

Carlisle F. Ferrin.

Thomas W. Rogers.

J. Clifton Taylor.

Harry M. Lee.

Emanuel A. Henkle.

*Edward C. Chipman.

Gurdon S. Allyn.

Daniel Sullivan.

Joseph M. Ganey.

James L. Harrington.

William D. Cronin.

Henry A. Rogers.

Norwich:

Lewis S. Paddock.

William Witter.

William S. C. Perkins.

Patrick Cassidy.

LEONARD B. ALMY.

Anthony Peck.

Edward P. Brewer.

Newton P. Smith.

Witter K. Tingley.

William T. Browne.

George R. Harris.

Rush W. Kimball.

James J. Donahue.

Harry E. Higgins.

Charles H. Perkins.

Patrick H. Harriman.

Dennis J. Shahan.

Patrick J. Cassidy.

Edward J. Brophy.

Leone F. LaPierre.

TAFTVILLE:

George Thompson.

YANTIC:

Herbert H. Howe.

Stonington:

Charles E. Brayton.

Norman L. Drake.

George D. Stanton.

MYSTIC:

Frank A. Coates.

Louis M. Allyn.

William H. Gray.

OLD MYSTIC:

*Albert T. Chapman.

Waterford:

George M. Minor.

*Exempted from taxation.

FAIRFIELD COUNTY.

D. CHESTER BROWN, M.D., Danbury, *President*.

SAMUEL PIERSON, M.D., Stamford, *Vice President*.

*FRANK W. STEVENS, M.D., Bridgeport, *Secretary*.

JAMES D. GOLD, M.D., Bridgeport, *Treasurer*.

Councilor—GOULD A. SHELTON, M.D., Shelton.

Censors—WILLIAM J. TRACEY, M.D., EDWARDS M. SMITH, M.D.,
WILLIAM S. RANDALL, M.D.

Annual Meeting, Second Tuesday in April, at Bridgeport;
Semi-Annual, Second Tuesday in October.

Bridgeport:

Andrew J. Smith.....	191 Barnum Avenue.
GEORGE L. PORTER.....	372 State Street.
Robert Lauder	310 Fairfield Avenue.
*N. E. WORDIN.....	274 Fairfield Avenue.
F. M. Wilson.....	834-836 Myrtle Avenue.
F. B. Downs.....	906 Lafayette Street.
J. W. Wright.....	808-810-812 Myrtle Avenue.
A. A. Holmes.....	991 Broad Street.
Charles C. Godfrey.....	340 State Street.
S. M. Garlick.....	474 State Street.
Henry Blodget.....	477 State Street.
J. C. Lynch.....	826 Myrtle Avenue.
C. C. Hoyt.....	1289 State Street.
G. W. Osborn.....	888 Broad Street.
J. R. Topping.....	349 Noble Avenue.
B. W. White.....	390 State Street.
Jacob May.....	816 North Avenue.
F. C. Graves.....	561 State Street.
G. B. Cowell.....	502 East Washington Avenue.
George E. Ober.....	391 Main Street.
D. C. DeWolfe.....	516 Fairfield Avenue.
Henry S. Miles.....	417 State Street.
Charles L. Banks.....	306 West Avenue.
Fessenden L. Day.....	477 State Street.
Edward Fitzgerald.....	526 East Washington Avenue.
George S. Ford.....	527 State Street.
Frank M. Tukey.....	429 State Street.

*Exempted from taxation.

William W. Gray.....	346 West Avenue.
James D. Gold.....	839 Myrtle Avenue.
Reuben A. Lockhart.....	760 Washington Avenue.
Harriet A. Thompson.....	695 Warren Street.
Frederick J. Adams.....	327 Fairfield Avenue.
W. J. A. O'Hara.....	361 Barnum Avenue.
David M. Trecartin.....	860 Park Avenue.
Harry W. Fleck.....	421 State Street.
Thomas L. Ellis.....	332 West Avenue.
Charles R. Townsend.....	346 State Street.
Herbert E. Smyth.....	376 John Street.
J. Murray Johnson.....	385 State Street.
Elmer F. Blank.....	387 Noble Avenue.
Irving L. Nettleton.....	385 Noble Avenue.
Edwards M. Smith.....	340 State Street.
Frank L. Smith.....	2178 Main Street.
David B. Wason.....	311 State Street.
Thomas F. Stanton.....	374 State Street.
Edward Dorland Smith.....	834 Myrtle Avenue.
*Frank W. Stevens.....	829 Myrtle Avenue.
George Howell Warner.....	429 State Street.
Daniel Michael Driscoll.....	467 State Street.
Chester E. Blackman.....	1119 Stratford Avenue.
David H. Monahan.....	525 State Street.
George F. Sheedy.....	2059 Main Street.
Henry E. Waterhouse.....	430 State Street.
Robert J. Lynch.....	231 Fairfield Avenue.
Charles J. Leverty.....	469 State Street.
Philip W. Bill.....	534 Fairfield Avenue.
Louis Smirnow.....	323 State Street.
Albert J. Roberts.....	346 State Street.
F. Winthrop Pyle.....	808 Myrtle Avenue.
Eli B. Ives.....	469 State Street.
Frank H. Coops.....	411 State Street.
William C. Watson.....	446 Stratford Avenue.
Jacob W. Gerber.....	662 East Main Street.
Herman E. Schultz.....	475 State Street.
Nathan T. Pratt.....	1221 Stratford Avenue.
Charles H. Haskell.....	467 State Street.
Morris J. Greenstein.....	107 Barnum Avenue.
Philip J. Curran.....	475 State Street.
Grovanis Formietelli.....	48 Walter Street.
James L. Sullivan.....	539 East Main Street.

*Exempted from taxation.

Robert B. Keen.....18 N. Washington Avenue.
 William C. Bowers.....336 State Street.
 Charles W. Gardner.....449 State Street.

Bethel:

A. E. Barber.
 George DeWitt Wight.
 Homer F. Moore.
 Charles R. Hart.

Brookfield:

Otis W. Sedgwick.

Danbury:

F. P. Clark.
 E. A. Stratton.
 W. S. Watson.
 D. Chester Brown.
 H. F. Brownlee.
 Nathaniel Selleck.
 George E. Lemmer.
 *Charles F. Craig, U. S. A.
 William F. Gordon.
 William T. Bronson.
 Richard M. English.
 Paul U. Sunderland.

Darien:

George H. Noxon.

NOROTON:

M. W. Robinson.
 Albert L. House.
 J. Wait Avery.

Fairfield:

W. H. Donaldson.

GREENFIELD HILL:

M. V. B. Dunham.

GREENS FARMS:

David W. McFarland.

SOUTHPORT:

Joseph L. Hetzel.
 Robert E. Perdue.

Greenwich:

Frank Terry Brooks.
 Fritz C. Hyde.
 William L. Griswold.
 Alvin W. Klein.
 Lloyd O. Thompson.
 John A. Clarke.
 William Burke.
 Harriet Baker Hyde.

RIVERSIDE:

Charles Smith.

Huntington—SHELTON:

GOULD A. SHELTON.
 William S. Randall.
 Francis I. Nettleton.
 Joseph G. Mahoney.

Monroe—STEPNEY:

SETH HILL.

New Canaan:

Clarence H. Scoville.
 Myre J. Brooks.
 Edmund J. O'Shaughnessy.

Norwalk:

James G. Gregory.
 R. L. Higgins.
 S. H. Huntington.
 William J. Tracey.
 Arthur R. Turner.
 Jesse M. Coburn.
 Walter Hitchcock.
 Ward S. Gregory.
 Franklin G. Brown.

SOUTH NORWALK:

C. G. Bohannan.
 Lauren M. Allen.

*Exempted from taxation.

SOUTH NORWALK :

Henry C. Sherer.
Jean Dumortier.
Wright B. Bean.
Francis J. Burnell.

EAST NORWALK :

Frederick B. Baker.

Redding:

Ernest H. Smith.

Ridgefield:

Russell W. Lowe.
Howard P. Mansfield.

Stamford:

A. M. Hurlbut.
Samuel Pierson.
A. N. Phillips.
P. P. Van Vleet.
F. Schavoir.
William B. Treadway.
Rosavelle G. Philip.
George Sherrill.
Watson E. Rice.

Frank M. Tiffany.
George R. Hertzberg.
John J. Cloonan.
Dean Foster.
Donald R. MacLean.
Frank H. Barnes.
John H. Staub.
James G. Burr.
Richard L. Bohannon.
John J. Ryle.
John F. Harrison.

Stratford:

W. B. Cogswell.
G. F. Lewis.

Weston—LYONS PLAINS :

F. Gorham.

Westport:

F. Powers.
F. D. Ruland.
*L. H. Wheeler, U. S. A.

Wilton:

A. B. Gorham.

WINDHAM COUNTY.

R. C. PAINE, M.D., Thompson, *President*.

JOHN WELDON, M.D., Willimantic, *Vice President*.

*JAMES L. GARDNER, M.D., Central Village, *Secretary*.

Councilor—FRANK E. GUILD, M.D., Windham.

Censors—JAMES L. GARDNER, M.D., GEORGE W. MAY, M.D.,
C. E. SIMMONS, M.D.

Annual Meeting, Third Thursday in April.

Brooklyn—WAUREGAN :

*A. H. Tanner.

Danielson:

RIENZI ROBINSON.
W. H. Judson.
C. J. LeClair.

James R. Shannon.
George M. Burroughs.

Killingly:

Ashael E. Darling.
Henry L. Hammond.
George Barnes.

*Exempted from taxation.

EAST KILLINGLY:

Charles E. Hill.

Moosup:

Charles N. Allen.

W. W. Adams.

CENTRAL VILLAGE:

*James L. Gardner.

Plainfield:

Arthur A. Chase.

Pomfret:

S. B. Overlock.

Putnam:

John B. Kent.

F. A. Morrell.

Omar LaRue.

Warren W. Foster.

Henry R. Lowe.

Marguerite J. Bullard.

Edward F. Perry.

Thompson:

Robert C. Paine.

NORTH GROSVENORDALE:

Emilien Rock.

Windham:

F. E. Guild.

Willimantic:

Frederick Rogers.

T. MORTON HILLS.

T. R. Parker.

John Weldon.

R. C. White.

George W. May.

Laura H. Hills.

Joseph A. Girouard.

Clarence E. Simonds.

Owen O'Neil.

Charles H. Girard.

J. H. Egbert.

Woodstock—EAST WOODSTOCK:

Charles C. Gildersleeve.

LITCHFIELD COUNTY.

IRVING L. HAMANT, M.D., Norfolk, *President*.SALMON G. HOWD, M.D., Winsted, *Vice President*.*FRANK H. LEE, M.D., Canaan, *Secretary*.*Councilor*—EDWARD H. WELCH, M.D., West Winsted.*Censors*—H. D. MOORE, M.D., C. I. PAGE, M.D., JOSIAH SWETT, M.D.

Annual Meeting, Fourth Tuesday in April; Semi-Annual, Second Tuesday in October.

Bethlehem:

Etta May Hadley-Judd.

Canaan—FALLS VILLAGE:

Albert E. Cobb.

Francis S. Skiff.

Cornwall—WEST CORNWALL:

Joseph Robinson.

Howard G. Stevens.

Goshen:

J. H. North.

Noah S. Wadhams.

*Exempted from taxation.

Litchfield:

J. T. Sedgwick.
 John L. Buel.
 Charles N. Warner.
 Charles I. Page.
 Walter L. Rathbun.
 Lyman F. Phillips.

New Hartford:

Josiah Sweet.

New Milford:

George E. Staub.
 George H. Wright.

Norfolk:

John C. Kendall.
 I. L. Hamant.
 Lucius D. Bulkley.
 Frederick S. Dennis.

North Canaan—CANAAN:

Charles W. Camp.
 Frank H. Lee.
 John G. Adam.

Plymouth—TERRYVILLE:

W. W. Wellington.
 A. V. Stoughton.
 Robert E. Harrington.

Salisbury:

Philip H. Sellew.

LAKEVILLE:

William Bissell.
 George H. Knight.
 William B. Bissell.
 Ernest R. Pike.

Sharon:

Clarence W. Bassett.
 Jerome S. Chaffee.

Thomaston:

George D. Ferguson.
 Robert Hazen.
 Ralph S. Goodwin.

Torrington:

William L. Platt.
 Thatcher S. Hanchett.
 Elias Pratt.
 Jerome S. Bissell.
 James D. Hayes.
 Abram J. Barker.
 Charles H. Carlin.
 *Sanford H. Wadhams.
 H. D. Moore.
 William J. Hogan.
 Timothy M. Ryan.
 Harry B. Hanchett.
 George Streit.

Washington:

Frederic W. Wersebe.

Watertown:

Ernest K. Loveland.

Winchester—WINSTED:

Edward L. Pratt.
 William S. Hulbert.
 *Salmon G. Howd.
 David D. Reidy.
 Ernest R. Kelsey.
 Norman B. Saunders.
 Edward H. Welch.
 William S. Richards.

Woodbury—HOTCHKISSVILLE:

William G. Reynolds.

*Exempted from taxation.

MIDDLESEX COUNTY.

JAMES MURPHY, M.D., Middletown, *President*.

M. D. MURPHY, M.D., Middletown, *Vice President*.

*A. B. COLEBURN, M.D., Middletown, *Secretary*.

Councilor—FRANK K. HALLOCK, M.D., Cromwell.

Censors—C. H. HUBBARD, M.D., J. E. BAILEY, M.D., M. C. HAZEN, M.D.

Annual Meeting, Second Thursday in April; Semi-Annual, Second Thursday in October.

Chatham—MIDDLE HADDAM:

George N. Lawson.

EAST HAMPTON:

Albert Field.

Arthur H. Myers.

Chester:

Fred Sumner Smith.

Clinton:

David Austin Fox.

Cromwell:

Frank K. Hallock.

Charles E. Bush.

Sydney H. Lord.

East Haddam:

M. W. Plumstead.

Essex:

Frederick Barton Bradeen.

Charles C. Davis.

Haddam:

Miner C. Hazen.

Killingworth:

Edward P. Nichols.

Middletown:

William E. Fisher.

Charles E. Stanley.

Henry S. Noble.

Michael D. Murphy.

John E. Bailey.

Arthur J. Campbell.

Arthur B. Coleburn.

J. Francis Calef.

*John E. Loveland.

Kate C. Mead.

Daniel A. Nolan.

John H. Mountain.

Charles B. Young.

Jessie W. Fisher.

James T. Mitchell.

James Henry Kingman.

Thomas Patrick Walsh.

James Murphy.

James M. Kenniston.

Lewis Maitland.

Old Saybrook:

Calista V. Luther.

Irwin Granniss.

Edward Gould Rowland.

Portland:

Cushman A. Sears.

Frank E. Potter.

Dennis L. Glynn.

Frederick T. Fitch.

Saybrook—DEEP RIVER:

*Edwin Bidwell.

Howard T. French.

Arthur Pratt.

*Exempted from taxation.

TOLLAND COUNTY.

JAMES STRETCH, M.D., Stafford, *President*.

ISAAC P. FISKE, M.D., Coventry, *Vice President*.

*ELI P. FLINT, M.D., Rockville, *Secretary*.

Councilor—THOMAS F. ROCKWELL, M.D., Rockville.

Censors—FREDERICK W. WALSH, M.D., CYRUS E. PENDLETON, M.D.,
FRANK L. SMITH, M.D.

Annual Meeting, Third Tuesday in April; Semi-Annual, Third
Tuesday in October.

Coventry:

Isaac P. Fiske.

SOUTH COVENTRY:

W. L. HIGGINS.

Louis I. Mason.

Ellington:

Edwin T. Davis.

Hebron:

Cyrus H. Pendleton.

Cyrus E. Pendleton.

Mansfield—MANSFIELD DEPOT:

Frederick E. Johnson.

William E. Cramm.

Rockville:

Frederick Gilnack.

Thomas F. Rockwell.

Eli P. Flint.

Thomas F. O'Laughlin.

Ernest O. Winship.

Dean C. Bangs.

Frederick W. Walsh.

Somers:

Alonzo L. Hurd.

Stafford—STAFFORD SPRINGS:

CRYUS B. NEWTON.

Frank L. Smith.

James Stretch.

John P. Hanley.

Tolland:

William N. Simmonds.

Vernon:

*ALFRED R. GOODRICH.

*Exempted from taxation.

OFFICERS OF THE CONNECTICUT STATE MEDICAL SOCIETY FROM ITS ORGANIZATION IN 1792 TO THE PRESENT TIME.*

PRESIDENTS.

1792	Leverett Hubbard.	1876	Ashbel W. Barrows.
1794	Eneas Munson.	1877	Robert Hubbard.
1801	James Potter.	1878	Charles M. Carleton.
1803	Thomas Mosley.	1879	Alfred R. Goodrich.
1804	Jercmiah West.	1880	Gideon L. Platt.
1807	John R. Watrous.	1881	William Deming.
1812	Mason F. Cogswell.	1882	William G. Brownson.
1822	Thomas Hubbard.	1883	Elisha B. Nye.
1827	Eli Todd.	1884	Benjamin N. Comings.
1829	John S. Peters.	1885	Elijah C. Kinney.
1832	William Buel.	1886	Thomas H. Hills.
1834	Thomas Miner.	1887	Francis Bacon.
1837	Silas Fuller.	1888	George L. Porter.
1841	Elijah Middlebrook.	1889	Orlando Brown.
1843	Luther Ticknor.	1890	Melancthon Storrs.
1846	Archibald Welch.	1891	Charles A. Lindsley.
1849	George Sumner.	1892	Cyrus B. Newton.
1851	Rufus Blakeman.	1893	Francis D. Edgerton.
1853	Richard Warner.	1894	Francis N. Braman.
1854	William H. Cogswell.	1895	Seth Hill.
1856	Benjamin H. Catlin.	1896	Rienzi Robinson.
1858	Ashbel Woodward.	1897	Ralph S. Goodwin.
1861	Josiah G. Beckwith.	1898	Henry P. Stearns.
1863	Ebenezer K. Hunt.	1899	Charles S. Rodman.
1865	Nathan B. Ives.	1900	Leonard B. Almy.
1866	Isaac G. Porter.	1901	John H. Grannis.
1867	Charles Woodward.	1902	Gould A. Shelton.
1868	Samuel B. Beresford.	1903	Samuel B. St. John.
1869	Henry Bronson.	1904	William H. Carmalt.
1870	Charles F. Sumner.	1905	†Edward H. Welch.
1871	Gurdon W. Russell.		{ Nathaniel E. Wordin.
1872	Henry W. Buel.	1906	William L. Higgins.
1873	Ira Hutchinson.	1907	Everett J. McKnight.
1874	Lowell Holbrook.	1908	Seldom B. Overlock.
1875	Pliny A. Jewett.		

*Prepared for the Secretary by Dr. J. B. Lewis, Hartford.

†Resigned.

VICE PRESIDENTS.

1792	Eneas Munson.	1874	Pliny A. Jewett.
1794	Elihu Tudor.	1875	Ashbel W. Barrows.
1796	James Potter.	1876	Robert Hubbard.
1801	Thomas Mosley.	1877	Charles M. Carleton.
1803	Jeremiah West.	1878	Alfred R. Goodrich.
1804	Jared Potter.	1879	Gideon L. Platt.
1806	John R. Watrous.	1880	William Deming.
1807	Mason F. Cogswell.	1881	William G. Brownson.
1812	John Barker.	1882	Elisha B. Nye.
1813	Timothy Hall.	1883	Benjamin N. Comings.
1814	Thomas Hubbard.	1884	Elijah C. Kinney.
1822	Eli Todd.	1885	Samuel Hutchins.
1824	Eli Ives.	1886	Francis Bacon.
1827	John S. Peters.	1887	George L. Porter.
1829	William Buel.	1888	Orlando Brown.
1832	Thomas Miner.	1889	Charles J. Fox.
1834	Silas Fuller.	1890	Charles A. Lindsley.
1837	Elijah Middlebrook.	1891	Cyrus B. Newton.
1841	Luther Ticknor.	1892	Francis D. Edgerton.
1843	Archibald Welch.	1893	Francis N. Braman.
1846	Dyer T. Brainard.	1894	Seth Hill.
1847	George Sumner.	1895	Rienzi Robinson.
1849	Rufus Blakeman.	1896	Ralph S. Goodwin.
1851	Richard Warner.	1897	Henry P. Stearns.
1853	William H. Cogswell.	1898	Charles S. Rodman.
1854	Benjamin H. Catlin.	1899	Leonard B. Almy.
1856	Ashbel Woodward.	1900	John H. Grannis.
1858	Josiah G. Beckwith.	1901	Gould A. Shelton.
1861	Ebenezer K. Hunt.	1902	Samuel B. St. John.
1863	Nathan B. Ives.	1903	William H. Carmalt.
1865	Isaac G. Porter.	1904	Edward H. Welch.
1866	Charles Woodward.	1905	{ Frederick A. Morrell.
1867	Samuel B. Beresford.		{ Eli P. Flint.
1868	Henry Bronson.	1906	{ Samuel D. Gilbert.
1869	Charles F. Sumner.		{ Charles E. Brayton.
1870	Gurdon W. Russell.	1907	{ Franklin P. Clark.
1871	Henry W. Buel.		{ Miner C. Hazen.
1872	Ira Hutchinson.	1908	{ Irving L. Hamant.
1873	Lowell Holbrook.		{ Walter L. Barber.

SECRETARIES.

1792	Jared Potter.	1838	Archibald Welch.
1794	James Clark.	1843	Ralph Farnsworth.
1796	Daniel Sheldon.	1844	Worthington Hooker.
1798	Nathaniel Perry.	1846	Gurdon W. Russell.
1800	Samuel Woodward.	1849	Josiah G. Beckwith.
1801	William Shelton.	1858	Panet M. Hastings.
1805	John Barker.	1862	Leonard J. Sanford
1810	Eli Ives.	1864	Moses C. White.
1813	Joseph Foot.	1876	Charles W. Chamberlain.
1817	Jonathan Knight.	1883	Samuel B. St. John.
1827	Samuel B. Woodward.	1889	Nathaniel E. Wordin.
1830	George Sumner.	1905	Walter R. Steiner.
1832	Charles Hooker.		

TREASURERS.

1792	John Osborn.	1829	Joseph Palmer.
1793	Jeremiah West.	1834	Elijah Middlebrook.
1794	John Osborn.	1837	Luther Tichnor.
1796	Mason F. Cogswell.	1841	Virgil Maro Dow.
1800	William B. Hall.	1851	George O. Sumner.
1808	Timothy Hall.	1863	James C. Jackson.
1813	Richard Ely.	1876	Francis D. Edgerton.
1816	Thomas Miner.	1883	Erastus P. Swasey.
1817	John S. Peters.	1889	William W. Knight.
1827	William Buel.	1905	Joseph H. Townsend.

ALPHABETICAL LIST

OF THE

MEMBERS OF THE CONNECTICUT STATE MEDICAL SOCIETY,

With Date and Place of Graduation, and Post-Office Address.

In preparing this list the Secretary has followed the list in the Proceedings of 1892, made with great care and labor by Dr. J. B. Lewis for the Centennial year. It may be relied upon as being correct.

Abrams, Alva Elnathan.....	Albany, '81.....	Hartford.
Adam, John Geikie.....	Trinity, Tor., '00.....	North Canaan.
Adams, Frederick Joseph.....	Univ. N. Y., '95.....	Bridgeport.
Adams, Henry Ely.....	Yale, '02.....	Hartford.
Adams, William Waldo.....	Bellevue, '91.....	Moosup.
Alcott, Ralph Waldo Emerson.....	U. S. Med. Coll., '81.....	West Hartford.
Allen, Charles Noah.....	Univ. Vt., '81.....	Moosup.
Allen, Howard Oliver.....	Univ. N. Y., '79.....	Broad Brook.
Allen, Lauren Melville.....	P. & S., N. Y., '80.....	South Norwalk.
Allen, Millard Filmore.....	Med. Chi., Phila., '95.....	New Haven.
Alling, Arthur Nathaniel, B.A., Yale, '86.....	P. & S., N. Y., '91.....	New Haven.
Allyn, Gurdon Spicer.....	Univ. Pa., '03.....	New London.
Allyn, Lewis Maxson.....	Univ. Pa., '93.....	Mystic.
Almy, Leonard Ballou, B.A., Yale, '73.....	Bellevue, '76.....	Norwich.
Alton, Charles De Lancey.....	Bellevue, '75.....	Hartford.
Anderson, Arvid.....	Univ. Mich., '93.....	New Britain.
Anderson, Henry Gray.....	P. & S., N. Y., '89.....	Waterbury.
Arnold, Ernest Hermann.....	Yale, '94.....	New Haven.
Arnold, Harold Sears, B.A., Yale, '00.....	Yale, '03.....	New Haven.
Ashley, Edwin Fiske, Ph.B., Yale, '97.....	Yale, '00.....	Waterbury.
Atkinson, Edwin.....	Univ. Vt., '93.....	Niantic.
Atwater, Caleb Huntington.....	P. & S., N. Y., '71.....	Wallingford.
Avery, John Waite.....	Univ. Vt., '97.....	Noroton.
Axtelle, John Franklin.....	L. I. Hosp. Coll., '71.....	Hartford.
Backus, Harold Simeon.....	L. I. Hosp. Coll., '03.....	Broad Brook.
Bacon, Francis.....	Yale, '53.....	New Haven.
Bacon, Leonard Woolsey, Jr., B.A., Yale, '88.....	Yale, '92.....	New Haven.
Bailey, George Cornelius.....	Univ. N. Y., '86.....	Hartford.
Bailey, John Elmore.....	P. & S., N. Y., '85.....	Middletown.
Bailey, Michael Angelo.....	P. & S., Balt., '93.....	Hartford.
Baker, Frederick Birdseye.....	Univ. Md., '88.....	East Norwalk.
Bangs, Dean Cleveland.....	Balt. Med. Coll., '02.....	Rockville.
Banks, Charles Lincoln.....	P. & S., N. Y., '91.....	Bridgeport.
Barber, Alvin Elizur.....	Berkshire, '54.....	Bethel.
Barber, Walter Lewis.....	Bellevue, '73.....	Waterbury.

- Baribault, Arthur Octave.....Vict. Med. Coll., '89.....New Haven.
 Barker, Abram James.....Bellevue, '97.....Torrington.
 Barnes, Frank Hazelhurst.....N. Y. Hom. Med., '96.....Stamford.
 Barnes, George.....Univ. N. Y., '04.....Killingly.
 Barnes, Lewis, B.A., M.A., Yale, '47.....Buffalo Univ., '50.....Oxford.
 Barnes, Wm. Samuel, Ph.B., Yale, '95.....Yale, '97.....New Haven.
 Barnett, John Frederick.....Yale, '69.....West Haven.
 Barrows, Benj. Safford, Ph.B., Yale, '83.....Univ. N. Y., '87.....Hartford.
 Bartlett, Charles Joseph, B.A., Yale, '92;
 M.A., Yale, '94.....Yale, '95.....New Haven.
 Bassett, Clarence Wheeler.....Univ. N. Y., '82.....Sharon.
 Beach, Charles Coffing, Ph.B., Yale, '77....P. & S., N. Y., '82.....Hartford.
 Beach, Charles Edward.....Yale, '88.....Milford.
 Beach, Charles Thomas.....Yale, '05.....Hartford.
 Bean, William Hill, Ph.B., Yale, '82.....Yale, '03.....New Haven.
 Bean, Wright Butler.....P. & S., N. Y., '95....South Norwalk.
 Bedford, Alletta Langdon, A.B., Cornell....Cornell, '05.....Waterbury.
 Beebe, George Hoxie.....Univ. N. Y., '78.....Guilford.
 Bell, George Newton.....Yale, '92.....Hartford.
 Bell, Newton Stephen.....Univ. Vt., '64.....Windsor.
 Bellosa, Frederick.....Yale, '72.....New Haven.
 Benedict, John Mitchell.....Univ. N. Y., '82.....Waterbury.
 Bercinsky, David.....Yale, '02.....New Haven.
 Bevan, Charles Ambrose.....Med. Chi., Chicago, '87....West Haven.
 Bevans, Theodore Frank.....Univ. Minn., '03.....Waterbury.
 Bidwell, Edwin.....Yale, '47.....Deep River.
 Bill, Philip Worcester, Ph.B., Yale, '97....P. & S., N. Y., '01.....Bridgeport.
 Bishop, Frederic Courtney, B.A., Yale, '92....Yale, '95.....New Haven.
 Bishop, Louis Bennett, B.A., Yale, '86.....Yale, '88.....New Haven.
 Bissell, Jerome Samuel.....Yale, '94.....Torrington.
 Bissell, William, B.A., Yale, '53.....Yale, '56.....Lakeville.
 Bissell, William Bascom, A.B., Yale, '88....P. & S., N. Y., '92.....Lakeville.
 Blackman, Chester Eugene.....L. I. Hosp. Coll., '97.....Bridgeport.
 Blair, Edward Holden.....P. & S., Balt., '06.....Hartford.
 Blake, Eugene Maurice.....Yale, '06.....New Haven.
 Blanchard, Irving DeLoss.....Yale, '97.....Hartford.
 Blank, Elmer Francis.....Starling, '97.....Bridgeport.
 Blodget, Henry, A.B., Yale, '75.....Bellevue, '81.....Bridgeport.
 Blumer, George.....Cooper Med. Coll., '90....New Haven.
 Bohannon, Charles Gordon.....Univ. N. Y., '78.....South Norwalk.
 Bohannon, Richard Lee.....Univ. N. Y., '74.....Stamford.
 Botsford, Charles Porter.....Yale, '94.....Hartford.
 Boucher, James Joseph.....P. & S., Balt., '04.....Hartford.
 Boucher, John Bernard.....P. & S., Balt., '94.....Hartford.
 Bowen, William Cutler.....P. & S., N. Y., '77.....Bridgeport.
 Boynton, Francis Nichols.....Univ. Mich., '03.....New Haven.
 Brackett, Arthur Stone, B.A., Yale, '92....Jefferson, '95.....Bristol.
 Brackett, William Walker.....Jefferson, '96.....New Britain.
 Bradeen, Frederick Barton.....Univ. Pa., '99.....Essex.
 Bradley, Mark Spalding.....P. & S., N. Y., '92.....Hartford.
 Bradstreet, Edward Thomas, B.A., Yale, '74.P. & S., N. Y., '77.....Meriden.
 Brainard, Clifford Brewster, Ph.B., Yale, '94..Yale, '98.....Hartford.
 Brainard, Irving Edwin.....Yale, '02.....Wallingford.
 Braman, Francis Nelson.....Bellevue, '66.....New London.
 Brayton, Charles Erskine.....P. & S., N. Y., '73.....Stonington.

- Brennan, Ambrose Kirk.....Yale, '93.....New Haven.
 Brewer, Edward Pliny, Ph.D.....Dartmouth, '79.....Norwich.
 Bridge, John Law, B.S., Wesleyan, '88;
 Ph.D., Clark, '94.....Harvard, '03.....Thompsonville.
 Bromley, Daniel Tyler.....Yale, '67.....Hartford.
 Bronson, William Thaddeus.....Univ. N. Y., '98.....Danbury.
 Brooks, Frank Terry, B.A., Yale, '90.....L. I. Hosp. Coll., '93.....Greenwich.
 Brooks, Myre Joel.....Yale, '67.....New Canaan.
 Brophy, Edward Joseph.....Yale, '04.....Norwich.
 Brown, Charles Henry.....Univ. N. Y., '93.....Waterbury.
 Brown, David Chester.....Yale, '84.....Danbury.
 Brown, Franklin George.....L. I. Hosp. Coll., '95.....Norwalk.
 Browne, William Tyler, Ph.B., Yale, '78...Harvard, '82.....Norwich.
 Brownlee, Harris Fenton.....P. & S., N. Y., '88.....Danbury.
 Buel, John Laidlaw.....P. & S., N. Y., '88.....Litchfield.
 Bulkley, Lucius Duncan, A.B., Yale, '66;
 M.A.,P. & S., N. Y., '69.....Norfolk.
 Bull, John Norris.....P. & S., N. Y., '78.....Plainville.
 Bull, Thomas Marcus.....P. & S., N. Y., '87.....Naugatuck.
 Bullard, Marguerite Jane, A.B., Cornell, '02..Cornell Univ., '04.....Putnam.
 Bunce, Philip Dibble, A.B., Yale, '88.....P. & S., N. Y., '91.....Hartford.
 Burke, William.....L. I. Hosp. Coll., '96.....Greenwich.
 Burnell, Francis Edwin.....L. I. Hosp. Coll., '94..South Norwalk.
 Burr, James Green.....Univ. Balt., '93.....Stamford.
 Burr, Noah Arthur.....Yale, '01.....Manchester.
 Burroughs, George McClellan.....Balt. Med. Coll., '00.....Danielson.
 Bush, Charles Ellsworth.....Yale, '94.....Cromwell.
 Butler, William James.....L. I. Hosp. Coll., '95.....New Haven.

 Cahill, Joseph Henry.....Balt. Univ., '92.....Hartford.
 Caldwell, William Elry.....Balt. Med. Coll., '95.....West Suffield.
 Calef, Jeremiah Francis, B.A., Wesleyan, '77..Yale, '80.....Middletown.
 Callbreath, Joseph Hooker.....L. I. Coll. Hosp., '90.....Waterbury.
 Camp, Charles Welford.....Univ. N. Y., '74.....Canaan.
 Campbell, Arthur Joseph.....P. & S., Balt., '85.....Middletown.
 Carlin, Charles Henry.....Univ. Mich., '96.....Torrington.
 Carmalt, William Henry, M.A., Yale, '81..P. & S., N. Y., '61.....New Haven.
 Carrington, Charles.....P. & S., N. Y., '60.....Farmington.
 Carroll, John James.....Dartmouth, '97.....Naugatuck.
 Carver, John Preston.....Albany, '96.....Simsbury.
 Cassidy, Patrick.....Univ. Vt., '65.....Norwich.
 Cassidy, Patrick John, B.A., Yale, '94.....Johns Hopkins, '98.....Norwich.
 Castle, Frank Edwin.....Yale, '70.....Waterbury.
 Chaffec, Jerome Stuart, Ph.B., Yale, '94...Univ. Pa., '97.....Sharon.
 Chapman, Albert Taylor.....P. & S., N. Y., '64.....Old Mystic.
 Chase, Arthur Alverdo.....Harvard, '01.....Plainfield.
 Chatfield, Rollin Blackman.....Yale, '93.....Granby.
 Cheney, Benjamin Austin, B.A., Yale, '88..Yale, '90.....New Haven.
 Chester, Thomas Weston, B.A., Rutgers, '92;
 M.A., '95.....P. & S., N. Y., '95.....Hartford.
 Chillingworth, Felix Percy.....Yale, '07.....Wethersfield.
 Chipman, Edwin Clifford, A.B., Alfred Univ.,
 '87P. & S., N. Y., '91.....New London.
 Clark, Franklin Pierce.....P. & S., N. Y., '76.....Danbury.
 Clark, Robert Moses.....Univ. Pa., '91.....New Britain.

- Clarke, John Alexander.....Bellevue, '97.....Greenwich.
 Clary, George, A.B., Dartmouth, '52.....Yale, '57.....New Britain.
 Clifton, Harry Colman.....Univ. Pa., '01.....Hartford.
 Cloonan, John Joseph.....P. & S., Balt., '97.....Stamford.
 Coates, Franklin Avery, A.B., Brown, '72;
 A.M., '75.....P. & S., N. Y., '75.....Mystic.
 Cobb, Alfred Edward.....Yale, '98.....Falls Village.
 Coburn, Jessie Milton.....Boston Univ., '74.....Norwalk.
 Cochran, Levi Bennett.....Univ. Pa., '93.....Hartford.
 Cogswell, William Badger.....Bellevue, '81.....Stratford.
 Cohane, Timothy Francis.....Yale, '97.....New Haven.
 Cobolan, Michael James.....Univ. N. Y., '65.....New Britain.
 Coleburn, Arthur Burr.....P. & S., N. Y., '90.....Middletown.
 Conklin, James Henry.....Univ. Vt., '99.....Hartford.
 Converse, George Frederick.....Yale, '87.....New Haven.
 Coogan, Joseph Albert.....Bellevue, '76.....Windsor Locks.
 Cook, Ansel Granville.....P. & S., N. Y., '87.....Hartford.
 Cooley, Myron Lynus.....Buffalo Univ., '86.....Waterbury.
 Cooper, Louis Edward, Ph.B., Yale, '84.....Yale, '86.....Ansonia.
 Coops, Frank Harvey, B.A., Dalhousie, '88.....P. & S., Balt., '96.....Bridgeport.
 Cowan, Isabel.....Wom. Med. Coll., N. Y., '92, Waterbury.
 Cowell, George B.....P. & S., N. Y., '88.....Bridgeport.
 Cox, Ralph Benjamin.....McGill, '02.....Collinsville.
 Coyle, William Joseph.....Buffalo Univ., '85.....Windsor Locks.
 Craig, Charles Franklin.....Yale, '94.....Danbury.
 Cramm, William Edward.....Univ. Vt., '95.....Mansfield Center.
 Crane, Augustin Averill, B.A., Yale, '85.....Yale, '87.....Waterbury.
 Crary, David.....Yale, '69.....Hartford.
 Cronin, William Daniel.....P. & S., N. Y., '00.....New London.
 Crossfield, Frederick Solon.....Bellevue, '78.....Hartford.
 Crothers, Thomas Davison.....Albany, '65.....Hartford.
 Curran, Philip John.....P. & S., N. Y., '01.....Bridgeport.
 Curtiss, William Martin Stanley.....Univ. Balt., '93.....Bristol.
- Daggett, William Gibbons, B.A., Yale, '80.....Univ. Pa., '84.....New Haven.
 Darling, Ashael Ebenezer.....Harvard, '72.....Killingly.
 Dart, Frederick Howard.....P. & S., N. Y., '84.....Niantic.
 Davenport, Annabella Keith.....S. C. Med. Coll., '03.....Hartford.
 David, Adelard David.....Dartmouth, '89.....Waterbury.
 Davis, Charles Clarence.....Yale, '07.....Essex.
 Davis, Edwin Taylor.....Univ. Vt., '88.....Ellington.
 Davis, Elias Wyman, B.A., Yale, '80.....Yale, '92.....Seymour.
 Davis, Gustav Pierpont, B.A., Yale, '66.....P. & S., N. Y., '69.....Hartford.
 Davison, Luther Augustus.....Univ. N. Y., '82.....Hartford.
 Day, Fessenden Lorenzo, B.A., Bates, '90.....Bellevue, '93.....Bridgeport.
 Deane, Henry Augustus.....Dartmouth, '68.....South Windsor.
 DeForest, Louis Shepard, B.A., Yale, '79;
 M.A., Yale, '91.....Univ. Jena, '85.....New Haven.
 Delaney, William Joseph.....McGill Univ., '87.....Naugatuck.
 Delesdernier, Horace William.....Univ. Vt., '85.....Meriden.
 Deming, Dudley Brainard, Ph.B., Yale, '97.....P. & S., N. Y., '01.....Waterbury.
 Dennis, Frederic Shepard, B.A., Yale, '72;
 M.R.C.S.Bellevue, '74.....Norfolk.
 DeWolfe, Daniel Charles.....Univ. Vt., '86.....Bridgeport.
 Dickerman, Wilton Elias, B.A., Amherst, '90.....Yale, '93.....Hartford.

- Diefendorf, Allen Ross, B.A., Yale, '94....Yale, '96.....New Haven.
 Dillon, John Henry.....Yale, '04.....Waterbury.
 Dole, Mary Phylinda, B.S., Mt. Holyoke, '89..Wom. Med. Coll., Balt., '88, New Haven.
 Donahue, James Joseph.....P. & S., Balt., '96.....Norwich.
 Donahue, Michael Joseph.....Univ. Pa., '86.....Waterbury.
 Donaldson, William Henry.....Univ. N. Y., '81.....Fairfield.
 Douglass, Edmund Peaslee.....Univ. N. Y., '89.....Groton.
 Dowd, Michael Joseph.....Balt. Med. Coll., '01...Thompsonville.
 Dowling, John Francis.....L. I. Hosp. Coll., '90.....Hartford.
 Down, Edwin Augustus.....P. & S., N. Y., '87.....Hartford.
 Downey, Roger Charles.....Univ. Vt., '92.....Middletown.
 Downs, Frederick Bradley.....Univ. N. Y., '78.....Bridgeport.
 Drake, Norman Lucie.....Univ. N. Y., '91.....Stonington.
 Driscoll, Daniel Michael.....P. & S., N. Y., '00.....Bridgeport.
 Dumortier, Jean.....Univ. Ghent, Belg., '89, South Norwalk.
 Dunham, Martin Van Buren.....Harvard, '67.....Greenfield Hill.
 Dwyer, Patrick James, A.B., Fordham, '94..Univ. N. Y., '97.....Waterbury.
 Egbert, Jay Hohart, A.B., A.M., Univ.
 ChicagoP. & S., N. Y., '97.....Willimantic.
 Eggleston, Jeremiah Dewey.....P. & S., N. Y., '79.....Meriden.
 Eliot, Gustavus, B.A., Yale, '77; A.M.,
 Yale, '82.....P. & S., N. Y., '80.....New Haven.
 Ellis, Thomas Long, B.A., Yale, '94.....Yale, '96.....Bridgeport.
 Elmer, Oliver Edward.....P. & S., Balt., '94.....Hartford.
 Emmet, Francis Arthur.....Yale, '02.....Hartford.
 Enders, Thomas Burnham.....P. & S., N. Y., '91.....Hartford.
 Engelke, Charles.....P. & S., N. Y., '02.....Waterbury.
 English, Richard Matthew.....Yale, '98.....Danbury.
 Ensign, Robert Eleazer.....Albany, '57.....Berlin.
 Farrell, John Edward.....Univ. N. Y., '03.....Waterbury.
 Felty, John Wellington, A.M., Emporia,
 Kan., '97.....Jefferson, '84.....Hartford.
 Fenn, Ava Hamlin.....P. & S., Balt., '86.....Meriden.
 Ferguson, George Dean.....Univ. N. Y., '79.....Thomaston.
 Ferrin, Carlisle Franklin, B.A., Univ.
 Vt., '91.....P. & S., N. Y., '95.....New London.
 Ferris, Harry Burr, B.A., Yale, '87.....Yale, '90.....New Haven.
 Field, AlbertL. I. Hosp. Coll., '67...East Hampton.
 Finch, George Terwilliger, B.A., Hobart, '75;
 M.A., Hobart, '78.....Bellevue, '77.....Thompsonville.
 Fisher, Jessie Weston.....Wom. Med. Coll., Pa., '93, Middletown.
 Fisher, William Edwin.....Univ. Pa., '76.....Middletown.
 Fiske, Isaac Parsons.....Univ. N. Y., '75.....Coventry.
 Fitch, Frederick Tracy.....Yale, '04.....Portland.
 Fitzgerald, Charles.....Univ. Vt., '98.....Hartford.
 Fitzgerald, Edward.....P. & S., Balt., '84.....Bridgeport.
 Fitzgerald, William.....Univ. Vt., '95.....Hartford.
 Fleck, Harry Willard.....Jefferson, '96.....Bridgeport.
 Fleischner, Henry.....Yale, '78.....New Haven.
 Flint, Eli Percival.....Yale, '79.....Rockville.
 Flynn, James Henry Joseph.....Yale, '95.....New Haven.
 Fontaine, Alphonse.....Laval Univ., '92.....Norwich.
 Foote, Charles Jenkins, B.A., Yale, '83....Harvard, '87.....New Haven.
 Ford, Alice Porter.....Wom. Med. Coll., Pa., '04, New Haven.

- Ford, George Skiff.....Bellevue, '93.....Bridgeport.
 Formicelli, Giovanni.....Univ. Italy, '98.....Bridgeport.
 Foster, Dean, M.A., Univ. Kan.....Yale, '99.....Stamford.
 Foster, John Pierpont Codrington, B.A.,
 Yale, '69.....Yale, '75.....New Haven.
 Foster, Warren Woodend.....Harvard, '82.....Washington, D. C.
 Fox, Charles James.....Univ. N. Y., '76.....Hartford.
 Fox, David Austin.....Univ. & Belle., '02.....Clinton.
 Fox, Edward Gager.....Univ. N. Y., '83.....Wethersfield.
 Fox, Morton Earl.....L. I. Hosp. Coll., '03.....Uncasville.
 French, Howard Truman.....P. & S., N. Y., '91.....Deep River.
 Freney, John Daniel.....L. I. Hosp. Coll., '93.....Waterbury.
 Froelich, Charles Edward, M.A.,
 Copenhagen, '64.....Copenhagen, '70.....Hartford.
 Fromen, Ernst Theodore.....Milwaukee Med. Coll., '97, New Britain.
 Fuller, Horace Smith, B.A., Amherst, '58;
 A.M., '61.....P. & S., N. Y., '65.....Hartford.
 Gailey, John Joseph.....Bowdoin, '98.....Waterbury.
 Galvin, William.....Univ. Vt., '92.....Meriden.
 Gandy, Raymond Reeves.....Univ. Pa., '99.....Colchester.
 Ganey, Joseph Matthew.....P. & S., Balt., '04.....New London.
 Gardner, Charles Wesley.....Univ. Md., '01.....Bridgeport.
 Gardner, James Lester.....Univ. Vt., '81.....Central Village.
 Garlick, Samuel Middleton, B.A., Dart., '74..Harvard, '77.....Bridgeport.
 Gaylord, Charles Woodward, B.A., Yale, '70..Yale, '72.....Branford.
 Gerber, Jacob Wolf.....Univ. Md., '04.....Bridgeport.
 Gibbs, Joseph Addison.....P. & S., Chicago, '02.....Suffield.
 Gilbert, Samuel Dutton, B.A., Yale, '69....Yale, '71.....New Haven.
 Gildersleeve, Charles Childs.....Yale, '96.....East Woodstock.
 Gill, Michael Henry.....Yale, '96.....Hartford.
 Gilliam, William S.....Univ. Pa., '88.....South Manchester.
 Gillin, Charles Adelbert.....Univ. N. Y., '83.....New Britain.
 Gilnack, Frederick.....P. & S., N. Y., '67.....Rockville.
 Girard, Charles H.....Victoria, '96.....Willimantic.
 Girouard, Joseph Arthur.....Balt. Med. Coll., '99.....Willimantic.
 Gladwin, Ellen Hammond.....Wom. Med. Coll., N. Y., '72, Hartford.
 Glynn, Dennis Lawrence.....Balt. Med. Coll., '02.....Middletown.
 Godfrey, Charles Cartlidge.....Dartmouth, '83.....Bridgeport.
 Gold, James Douglass, Ph.B., Yale, '88....P. & S., '91.....Bridgeport.
 Gompertz, Louis Michael.....Yale, '96.....New Haven.
 Goodenough, Edward Winchester, B.A.,
 Yale, '87.....Yale, '93.....Waterbury.
 Goodrich, Alfred Russell.....Berkshire, '46.....Vernon.
 Goodrich, Charles Augustus, B.S.,
 Mass. Ag. Coll., '93.....P. & S., N. Y., '96.....Hartford.
 Goodrich, William Albert.....Med. Chi. Phila., '02.....Waterbury.
 Goodwin, Ralph Schuyler, Ph.B., Yale, '90..P. & S., N. Y., '93.....Thomaston.
 Goodyear, Robert Beardsley.....Yale, '68.....North Haven.
 Gordon, William Francis.....L. I. Hosp. Coll., '96.....Danbury.
 Gorham, Andrew Bennett.....Yale, '79.....Wilton.
 Gorham, Frank.....Yale, '76.....Lyons Plains.
 Granniss, Irwin.....Yale, '96.....Saybrook.
 Graves, Charles Burr, B.A., Yale, '82.....Harvard, '86.....New London.
 Graves, Frederick Chauncey.....Univ. N. Y., '88.....Bridgeport.

- Graves, Frederick George.....Yale, '92.....Waterbury.
 Gray, William Henry.....P. & S., N. Y., '89.....Old Mystic.
 Gray, William Wetmore, B.S., Dickinson, '85..Bellevue, '90.....Bridgeport.
 Greenstein, Morris Jacob.....Univ. South, '06.....Bridgeport.
 Gregory, James Glynn, B.A., Yale, '65.....P. & S., N. Y., '68.....Norwalk.
 Gregory, Ward Slosson, Ph.B., Yale, '99...P. & S., N. Y., '03.....Norwalk.
 Griggs, John Bagg.....Yale, '97.....Hartford.
 Griswold, Arthur Heywood, A.B.,
 Harvard, '02.....Johns Hopkins, '06.....Hartford.
 Griswold, Frederick Pratt.....P. & S., N. Y., '76.....Meriden.
 Griswold, Julius Egbert.....Univ. N. Y., '79.....Newington.
 Griswold, William Loomis, Ph.B., Yale, '81..P. & S., N. Y., '85.....Greenwich.
 Guild, Frank Eugene.....L. I. Hosp. Coll., '85.....Windham.
- Hadley-Judd, Etta May.....Wom. Med. Coll., Phila., '95, Bethlehem.
 Hall, Edward Dormenio.....Harvard, '73.....Meriden.
 Hall, Joseph Barnard.....Yale, '92.....Hartford.
 Hallock, Frank Kirkwood, A.B., Wesleyan,
 '82; A.M., '85.....P. & S., N. Y., '85.....Cromwell.
 Hamant, Irving Louis.....L. I. Hosp. Coll., '90.....Norfolk.
 Hamilton, Charles Allen.....Univ. Vt., '86.....Waterbury.
 Hammond, Henry Louis, Ph.B., Brown, '65..Harvard, '66.....Killingly.
 Hanchett, Harry Bigelow.....Jefferson, '05.....Torrington.
 Hanchett, Thatcher Swift.....Bellevue, '64.....Torrington.
 Hanley, John Patrick.....Cornell, '06.....Stafford Springs.
 Harriman, Patrick Henry.....Univ. N. Y., '84.....Norwich.
 Harrington, James Leon.....Jefferson, '03.....New London.
 Harrington, Robert Earl.....Balt. Med. Coll., '06.....Terryville.
 Harris, George Robert.....P. & S., N. Y., '85.....Norwich.
 Harrison, John Francis.....Jefferson, '03.....Stamford.
 Hart, Charles Remington.....P. & S., N. Y., '59.....Bethel.
 Hartshorn, Willis Ellis, Ph.B., '95,
 Colo. Coll.Univ. Minn., '98.....New Haven.
 Haskell, Charles Nahum.....Univ. Vt., '90.....Bridgeport.
 Hatheway, Clarence Morris.....Bellevue, '03.....Hartford.
 Hawkes, William Whitney, B.A., Yale, '79..Yale, '81.....New Haven.
 Hayes, James Dermot, B.S., Manhattan
 Coll., N. Y.Univ. N. Y., '94.....Torrington.
 Hayes, John Frances.....Univ. N. Y., '79.....Waterbury.
 Hazen, Miner Comstock.....Univ. Mich., '55.....Haddam.
 Hazen, Robert, A.B., Univ. Vt., '96.....Univ. Vt., '98.....Tbomaston.
 Heady, Elias Buel.....Yale, '72.....Milford.
 Henkle, Emmanuel Alexander.....Cornell, '99.....New London.
 Henze, Carl William.....Yale, '00.....New Haven.
 Hepburn, Thomas Norval, A.B., Randolph
 Macon, '00.....Johns Hopkins, '05.....Hartford.
 Herbert, Archibald Cecil.....Univ. Va., '03.....New Haven.
 Hertzberg, George Robert.....Dartmouth, '99.....Stamford.
 Hetzel, Joseph Linn.....Bellevue, '91.....Southport.
 Heublein, Arthur Carl.....P. & S., N. Y., '02.....Hartford.
 Hewes, Frank William.....Univ. Vt., '94.....Groton.
 Heyer, Harold Hankinson.....Univ. N. Y., '87.....New London.
 Higgins, Gould Shelton.....Yale, '01.....North Haven.
 Higgins, Harry Eugene.....Univ. N. Y., '96.....Norwich.
 Higgins, Royal Lacey.....Bellevue, '67.....Norwalk.

- Higgins, William Lincoln.....Univ. N. Y., '90.....South Coventry.
 Hill, Charles Edwin, B.A., Yale, '76.....Harvard, '79.....East Killingly.
 Hill, Seth.....Yale, '66.....Stepney.
 Hill, William Martin.....Univ. Va., '97.....Noank.
 Hills, Laura Heath.....Wom. Med. Coll., Pa.....Willimantic.
 Hills, Thomas Morton.....Yale, '63.....Willimantic.
 Hitchcock, Walter, Ph.B., Yale, '80.....P. & S., N. Y., '83.....Norwalk.
 Hodgson, Thomas Cady.....Toronto, '94.....East Berlin.
 Hogan, William John.....Yale, '98.....Torrington.
 Holbrook, Charles Werden, M.A.,
 Amherst, '93.....Yale, '96.....East Haven.
 Holmes, Arthur Almond.....Harvard, '65.....Bridgeport.
 Holroyd, Joseph Scripture.....P. & S., N. Y., '95.....Waterville.
 Horton, William Wickham.....Univ. N. Y., '79.....Bristol.
 Hotchkiss, Edward Alfred.....McGill, '04.....Collinsville.
 Hotchkiss, Norton Royce.....Univ. Md., '91.....New Haven.
 Houghton, Simon Willard.....Bellevue, '79.....Hazardville.
 House, Albert Lewis.....Yale, '95.....Noroton.
 Howard, Arthur Wayland.....Univ. N. Y., '90.....Wethersfield.
 Howard, John.....Dartmouth, '81.....Hartford.
 Howd, Salmon Jennings.....Jefferson, '83.....Winsted.
 Howe, Harmon George.....Univ. Vt., '73, P. & S., N. Y., '75, Hartford.
 Howe, Herbert H.....Univ. Vt., '80.....Yantic.
 Hoyt, Curtis Clark.....P. & S., N. Y., '87.....Bridgeport.
 Hoyt, Harold Eliphalet, A.B., Univ. Kansas, Albany, '94.....Waterbury.
 Hulbert, William Sharon.....Univ. N. Y., '80.....Winsted.
 Hungerford, Henry Edward.....Yale, '98.....Waterbury.
 Huntington, Samuel Henry.....Yale, '76.....Norwalk.
 Hupert, Julius, A.B., Univ. Lemberg.....Univ. Lemberg, '02.....New Britain.
 Hurd, Alonzo L., B.S., Me., '82.....Univ. Vt., '91.....Somers.
 Hurlbut, Augustin Moen, B.A., Yale, '76..P. & S., N. Y., '79.....Stamford.
 Hyde, Fritz Carleton.....Univ. Mich., '60.....Greenwich.
 Hyde, Harriet Baker.....Univ. Mich., '00.....Greenwich.
 Hynes, Thomas Vincent.....Yale, '00.....New Haven.
 Ingalls, Phineas Henry, A.B., Bowdoin, '77;
 A.M., Bowdoin, '85.....P. & S., N. Y., '80.....Hartford.
 Irving, Samuel Wellington.....Yale, '91.....New Britain.
 Isham, Oliver Kingsley.....Univ. N. Y., '88.....Hartford.
 Ives, Eli Butler.....Yale, '03.....Bridgeport.
 Jennings, George Herman.....L. I. Hosp. Coll., '75.....Jewett City.
 Johnson, Edwin Hines.....Univ. Vt., '88.....Naugatuck.
 Johnson, Frederick Eugene.....Univ. N. Y., '79.....Mansfield.
 Johnson, John Murray.....L. I. Hosp. Coll., '95.....Bridgeport.
 Johnson, Marcus Morton, Ph.B., Brown, '70..Univ. N. Y., '77.....Hartford.
 Jones, Daniel Albion, B.A., Yale, '84;
 D.M.D., Harvard, '89.....Yale, '92.....New Haven.
 Joslin, George Harvey.....Univ. Vt., '87.....Mt. Carmel.
 Judson, William Henry.....Jefferson, '78.....Danielson.
 Kane, Thomas Francis.....Bellevue, '87.....Hartford.
 Karrman, Edward William.....N. Y. Univ., '84.....Cheshire.
 Keane, Robert.....Bellevue, '03.....Bridgeport.
 Keith, Albert Russell, A.B., Colby, '97.....Harvard, '03.....Hartford.
 Kelsey, Ernest Russell.....Univ. Md., '01.....Winsted.

- Kellogg, Kenneth Evernghim.....P. & S., N. Y., '98.....New Britain.
 Kendall, John Calvin, B.A., Yale, '70.....P. & S., N. Y., '75.....Norfolk.
 Keniston, James Mortimer.....Harvard, '71.....Middletown.
 Kenna, William Matthew, Ph.B., Yale, '90..Yale, '92.....New Haven.
 Kent, John Bryden.....Harvard, '60.....Putnam.
 Kilbourn, Clarence Leishman.....Yale, '97.....New Haven.
 Kilbourn, Joseph Austin.....P. & S., Balt., '97.....Hartford.
 Kimball, Rush Wilmot, A.B., Williams, '87..L. I. Hosp. Coll., '90.....Norwich.
 King, Howard Frost.....Albany, '99.....Windsor.
 Kingman, James Henry, A.B., Yale, '82....P. & S., N. Y., '85.....Middletown.
 Kingsbury, Isaac William, A.B.,
 Harvard, '96.....P. & S., N. Y., '03.....Hartford.
 Kingsbury, William Sanford.....Yale, '96.....Glastonbury.
 Kirby, Frank Alonzo.....Columbian Univ., Wash., D. C., '95, New Haven.
 Klein, Alvin Walter.....Cin. Coll. Med. & Surg., '89, Greenwich.
 Knight, George Henry, A.M., Yale, '98....P. & S., N. Y., '86.....Lakeville.
 Knight, William Ward.....Univ. N. Y., '76.....Hartford.
 Kowalewski, Victor Alexander, B.A.,
 Yale, '99.....Yale, '02.....West Haven.
 Laden, Michael Richard.....Univ. N. Y., '98.....Hartford.
 Lally, Thomas John.....Albany, '99.....Waterbury.
 Lamb, Chauncey Stafford.....Buffalo Univ., '93.....New Haven.
 Lamson, Edward Rutledge, A.B.,
 Trinity, '91.....P. & S., N. Y., '96.....Hartford.
 Lane, Frederick Pollock.....Yale, '04.....New Haven.
 Lane, John Edward, B.A., Yale, '94;
 M.A., '97.....Yale, '03.....New Haven.
 LaPierre, Leone Franklin.....Yale, '01.....Norwich.
 LaPoint, John William Henry.....Laval Univ., Montreal, '92...Meriden.
 LaRue, Omer.....Vict., Montreal, '71.....Putnam.
 Lauder, Robert, M.A., Wesleyan, '89.....Yale, '71.....Bridgeport.
 Law, Homer Lycurgus.....Jefferson, '69.....Hartford.
 Lawson, George Newton, B.A., Yale, '90...Yale, '92.....Middle Haddam.
 Lawton, Franklin Lyman, Ph.B., Yale, '90..Yale, '93.....Hartford.
 Lay, Walter Sidders.....Yale, '01.....Hamden.
 LeClair, Charles Joseph.....Victoria, '87.....Danielson.
 Lee, Frank Herbert.....Albany, '88.....Canaan.
 Lee, Harry Moore.....Columbia, '98.....New London.
 Lemmer, George Edward.....Bellevue, '85.....Danbury.
 Leonard, George Arthur.....Md. Med. Coll., '05.....Waterville.
 Leverty, Charles Joseph.....N. Y. Univ. & Belle., '01...Bridgeport.
 Lewis, Dwight Milton, B.A., Yale, '97....Johns Hopkins, '01.....New Haven.
 Lewis, George Francis, B.A., '64.....Yale, '65.....Collinsville.
 Lewis, George Frederick, B.A., Trinity, '77..Yale, '84.....Stratford.
 Lewis, John Benjamin.....Univ. N. Y., '53.....Hartford.
 Lindsley, Charles Purdy, Ph.B., Yale, '75...Yale, '78.....New Haven.
 Littlejohn, Percy Duncan.....Yale, '97.....New Haven.
 Lockhart, Reuben Arthur.....Yale, '91.....Bridgeport.
 Lockwood, Howard DeForst.....Yale, '01.....Meriden.
 Loomis, Francis Newton, B.A., Yale, '81...Yale, '83.....Derby.
 Lord, Sydney Arthur.....Harvard, '94.....Cromwell.
 Loveland, Ernest Kilburn.....Yale, '97.....Watertown.
 Loveland, John Elijah, A.B., Wesleyan, '89..Harvard, '92.....Middletown.
 Lowe, Henry Russell.....Dartmouth, '82....Woodstock Valley.

- Lowe, Russell Walter.....Univ. N. Y., '89.....Ridgefield.
 Luhy, John Francis, Ph.B., Yale, '76.....P. & S., N. Y., '78.....New Haven.
 Ludington, Nelson Amos.....Yale, '01.....New Haven.
 Luther, Calista Vinton.....Wom. Med. Coll., Pa., '85.....Saybrook.
 Lyman, David Russell.....Univ. Va., '99.....Wallingford.
 Lynch, John Charles.....Univ. N. Y., '86.....Bridgeport.
 Lynch, Robert Joseph.....Bellevue, '97.....Bridgeport.
 Lyon, Edwin Bradbury.....Berkshire, '62.....New Britain.
 Lyon, Trehy Williams.....Yale, '03.....New Haven.

 MacLean, Donald Robert.....Balt. Med. Coll., '01.....Stamford.
 Maguire, Edward O'Reilly.....P. & S., N. Y., '98.....Derby.
 Maher, James Stephen, Ph.B., Yale, '92.....Yale, '96.....New Haven.
 Maher, Stephen John.....Yale, '87.....New Haven.
 Mahoney, Joseph George.....Yale, '03.....Shelton.
 Mailhouse, Max, Ph.B., Yale, '76.....Yale, '78.....New Haven.
 Maitland, Lewis.....Univ. Pa., '95.....Middletown.
 Maloney, Daniel Joseph.....Univ. N. Y., '96.....Waterbury.
 Mansfield, Howard Parker.....L. I. Hosp. Coll., '93.....Ridgefield.
 Mariani, Nicola.....Univ. Naples, '93.....New Haven.
 Marsh, Arthur Washburn.....Univ. Vt., '82.....New Haven.
 Martelle, Henry Augustus, A.B.,
 Bowdoin, '01.....Johns Hopkins, '05.....Hartford.
 Mason, Louis Irving.....P. & S., N. Y., '91.....South Coventry.
 Mathewson, Earl.....P. & S., N. Y., '79.....Durham.
 May, George William.....Milwaukee, '95.....Willimantic.
 May, Jacob Rush.....Chicago, '76.....Bridgeport.
 Mayberry, Franklin Hayden.....Univ. Vt., '85.....Burnside.
 Mayer, Nathan.....Cincinnati, '57.....Hartford.
 McCabe, Edward Michael, B.A.,
 Manhattan, '83.....Yale, '87.....New Haven.
 McCarthy, Timothy William.....Balt. Med. Coll., '06.....Rockville.
 McCook, John Butler.....P. & S., N. Y., '94.....Hartford.
 McDonnell, Ralph Augustine, B.A.,
 Yale, '90.....Yale, '92.....New Haven.
 McFarland, David Walter.....Univ. N. Y., '85.....Greens Farms.
 McGaughey, James David.....Jefferson, '70.....Wallingford.
 McIntosh, Edward Francis.....Yale, '97.....New Haven.
 McIntosh, James Fahien.....Victoria, '87.....North Grosvenordale.
 McKee, Frederick Lyman.....P. & S., N. Y., '99.....Hartford.
 McKnight, Everett James, B.A., Yale, '76.....P. & S., N. Y., '79.....Hartford.
 McLarney, Thomas Joseph.....P. & S., Balt., '97.....Waterbury.
 McLinden, James John.....Univ. Pa., '98.....Waterbury.
 McMaster, Gilbert Totten.....Jefferson, '98.....New Haven.
 McNeil, Rollin.....Yale, '62.....New Haven.
 McPartland, Patrick Farrel.....Balt. Med. Coll., '05.....Hartford.
 Meade, Kate Campbell.....Wom. Med. Coll., Pa., '88, Middletown.
 Meeks, Harold Albert.....Bellevue, '90.....Meriden.
 Meyers, Arthur Henry.....Med. Chi., Phila., '02.....East Hampton.
 Miles, Henry Shillingford, Ph.G., N. Y., '88.....P. & S., N. Y., '91.....Bridgeport.
 Miller, George Root.....P. & S., Balt., '86.....Hartford.
 Miller, William Radley.....Albany, '98.....Southington.
 Minor, George Maynard.....L. I. Hosp. Coll., '85.....Waterford.
 Mitchell, James Thomas.....Univ. N. Y., '91.....Middletown.
 Molumphy, David James.....Jefferson, '06.....Hartford.

Monagan, Charles Andrew, B.S.,

Trinity, '93.....Univ. Pa., '98.....Waterbury.

Monahan, David Henry, M.A.,

Manhattan, '83.....Dartmouth, '00.....Bridgeport.

Moody, Mary Blair.....Buffalo, '76.....New Haven.

Moore, Homer Franklin.....Wash. Univ., Mo., '98.....Bethel.

Moore, Howard Doolittle.....Bellevue, '97.....Torrington.

Morasse, Lewis Ovid.....Univ. Vict., '84.....Putnam.

Morgan, William Dennison, A.B.,

Trinity, '02.....P. & S., N. Y., '76.....Hartford.

Moriarty, James Ligouri.....Harvard, '96.....Waterbury.

Morrell, Frederick Augustus.....L. I. Hosp. Coll., '85.....Putnam.

Moser, Oran Alexander.....Yale, '02.....Rocky Hill.

Moulton, Edward Seymour, B.A.,

Oberlin, '91.....Yale, '94.....New Haven.

Mountain, John Henry.....Jefferson, '96.....Middletown.

Munger, Carl Eugene, Ph.B., Yale, '80....P. & S., N. Y., '83.....Waterbury.

Murphy, James.....Univ. Pa., '95.....Portland.

Murphy, Michael Daniel.....Bellevue, '84.....Middletown.

Murphy, Walter Graham.....Albany Med. Coll., '90..East Hartford.

Nadler, Alfred Goldstein, B.A., Yale, '93....Yale, '96.....New Haven.

Naylor, James Henry.....Univ. Vt., '95.....Hartford.

Nelson, Abiel Ward.....Harvard, '61.....New London.

Nettleton, Francis Irving, Ph.B., Yale, '94....Yale, '97.....Shelton.

Nettleton, Irving LaField.....L. I. Hosp. Coll., '98.....Bridgeport.

Newton, Cyrus Brownlie.....Yale, '56.....Stafford Springs.

Newton, Matthew Turner.....Yale, '51.....Suffield.

Nickerson, Nebemiah.....N. Y. Med. Coll., '57.....Meriden.

Nicoll, John.....Yale, '54.....New Haven.

Noble, Henry Smith, A.B., Tufts, '69;

LL.D., Tufts, '05.....P. & S., N. Y., '71.....Middletown.

Nolan, Daniel Andrew, Ph.G., Phil., '93...Med. Chir., Phila.....Middletown.

North, Caroline.....Tufts, '98.....Wallingford.

North, Joseph Howard.....L. I. Hosp. Coll., '73.....Goshen.

Noxon, George Henry.....Balt. Med. Coll., '93.....Darien.

Ober, George Eugene.....Univ. Vt., '90.....Bridgeport.

O'Connell, Thomas Smith.....P. & S., Balt., '92.....East Hartford.

O'Connor, Matthew Charles, A.B., St.

Francis X., N. Y., '69.....P. & S., N. Y., '73.....New Haven.

O'Connor, Patrick Thomas.....Bellevue, '92.....Waterbury.

O'Flaberty, Ellen Pembroke.....Cornell, '01.....Hartford.

O'Hara, Bernard Augustine.....Bellevue, '82.....Waterbury.

O'Hara, William James Aloysius.....P. & S., Balt., '93.....Bridgeport.

O'Laughlin, Thomas Francis.....Univ. N. Y., '96.....Rockville.

O'Neil, Owen.....Jefferson, '04.....Willimantic.

Osborn, George Wakeman, B.A., Yale, '84....P. & S., N. Y., '87.....Bridgeport.

Osborne, Oliver Thomas.....Yale, '84.....New Haven.

O'Shaughnessy, Edmund Joseph.....Bellevue, '99.....New Canaan.

Otis, Samuel Dickinson.....Univ. N. Y., '77.....Meriden.

Outtersen, Richard Ambrose.....Jefferson, '02.....Windsor Locks.

Overlock, Seldom Burden, B.A., Colby, '86..Bellevue, '89.....Pomfret.

Owens, William Thomas.....Univ. Vt., '99.....Hartford.

Paddock, Lewis Sloat, M.A.....N. Y. Med. Coll., '54.....Norwich.

Page, Charles Ithamar.....P. & S., N. Y., '90.....Litchfield.

- Paine, Robert Child.....Dartmouth, '00.....Thompson.
 Park, Charles Edwin.....Yale, '81.....New Haven.
 Parker, Theodore Raymond.....Univ. N. Y., '80.....Willimantic.
 Parker, Thomas Edward.....Yale, '04.....Waterbury.
 Parmelee, Edward K.....L. I. Hosp. Coll., '89.....Ansonia.
 Parmele, George Luther, D.M.D.,
 Harvard, '70.....L. I. Hosp. Coll., '69.....Hartford.
 Parsons, Edward Field, A.B., Williams, '48..P. & S., N. Y., '58.....Thompsonville.
 Peck, Anthony, B.A., Hamilton, '72.....Univ. N. Y., '75.....Norwich.
 Peck, Robert Ellsworth, Ph.B., Yale, '90...Yale, '93.....New Haven.
 Peckham, Lucy Creemer.....Wom. Med. Coll., Pa., '85, New Haven.
 Pendleton, Cyrus Edmund.....Yale, '03.....Hebron.
 Pendleton, Cyrus Henry.....Western Reserve, '60.....Hebron.
 Perdue, Robert Ernest.....Starling, '92.....Southport.
 Perkins, Charles Harris.....P. & S., N. Y., '91.....Norwich.
 Perkins, William Sheldon Clark.....P. & S., N. Y., '60.....Norwich.
 Perry, Edward Franklin.....L. I. Hosp. Coll., '97.....Putnam.
 Pbelps, Charles Dickinson, B.A.,
 Amherst, '89; M.A., Amherst, '97.....P. & S., N. Y., '95.....West Haven.
 Philip, Rosavelle Gardner.....Wom. Med. Coll., N. Y. Inf., '75, Stamford.
 Phillips, Alfred Noroton.....P. & S., N. Y., '83.....Stamford.
 Phillips, Lyman Frank.....Yale, '06.....Litchfield.
 Pierce, Elbridge Worthington.....Univ. N. Y., '85.....Meriden.
 Pierson, John Corbin.....Tufts, '03.....Hartford.
 Pierson, Samuel.....P. & S., N. Y., '81.....Stamford.
 Pike, Ernest Reginald.....Univ. Mich., '98.....Lakeville.
 Pinney, Royal Watson.....P. & S., N. Y., '88.....Derby.
 Pitman, Edwin Parker, B.A.,
 Dartmouth, '86.....Dartmouth, '91.....New Haven.
 Platt, William Logan.....P. & S., N. Y., '81.....Torrington.
 Plummer, Paul.....Univ. Vt., '94.....Collinsville.
 Plumstead, Matthew Woodbury.....Jefferson, '87.....East Haddam.
 Pomeroy, Nelson Asa.....P. & S., N. Y., '96.....Waterbury.
 Poore, John Robinson.....Harvard, '94.....Waterbury.
 Porter, George Loring, B.A., Brown, '59...Jefferson, '62.....Bridgeport.
 Porter, Isaac Napoleon, B.A., Lincoln
 Univ., '90.....Yale, '93.....New Haven.
 Porter, William, Jr.....Chicago Med. Coll., '81.....Hartford.
 Potter, Frank Edward.....P. & S., N. Y., '89.....Portland.
 Potts, Joseph Henry.....Dartmouth, '05.....New Britain.
 Powers, Frederick.....P. & S., N. Y., '70.....Westport.
 Pratt, Arthur Milon.....Bellevue, '92.....Deep River.
 Pratt, Edward Loomis.....Univ. N. Y., '84.....Winsted.
 Pratt, Elias.....P. & S., N. Y., '87.....Torrington.
 Pratt, Nathan Tolles, A.B., Trinity, '94;
 M.A., '97.....Yale, '04.....Bridgeport.
 Purinton, Charles Oscar, Ph.B., Yale, '97...Yale, '00.....West Hartford.
 Pyle, Francis Winthrop, A.B., Yale, '97...P. & S., N. Y., '02.....Bridgeport.

 Ramsay, Otto Gustaf, M.A., Yale, '01, Hon., Univ. Va., '90.....New Haven.
 Rand, Richard Foster, Ph.B., Yale, '95...Johns Hopkins, '00.....New Haven.
 Randall, William Sherman, Ph.B.,
 Yale, '83.....P. & S., N. Y., '86.....Shelton.
 Rankin, Charles Goodrich, A.B.,
 Williams, '84; A.M., '87.....Chicago Med. Coll., '86...Glastonbury.

- Rathbun, Walter Latham.....Yalc, '03.....Litchfield.
 Reeks, Thomas Eben.....Univ. Md., '01.....New Britain.
 Reidy, David Dillon.....Med. Chi., Phila., '99.....Winsted.
 Reilly, Francis Henry.....Yale, '97.....New Haven.
 Reilly, James Michael.....Yale, '78.....New Haven.
 Reilly, Walter Augustine.....Bellevue, '98.....Naugatuck.
 Reinert, Emil Gustav.....Balt. Med. Coll., '95.....Hartford.
 Reynolds, William George.....Yalc, '97.....Woodbury.
 Rice, Watson Emmons.....Univ. Mich., '72.....Stamford.
 Richards, William Spencer.....Univ. N. Y., '89.....West Winsted.
 Ring, Henry Wilson, A.B., Bowdoin, '79;
 M.A., Bowdoin, '82.....Me. Med. Coll., '81.....New Haven.
 Ringe, Milo Pember.....P. & S., Cleveland, '05.....Madison.
 Rising, Harry Breed.....Yale, '95.....South Glastonbury.
 Rising, Henry Martin.....Yalc, '68.....South Glastonbury.
 Robbins, Charles Henry.....Balt. Med. Coll., '95.....New Haven.
 Robbins, George Orrin.....Yale, '79.....Waterbury.
 Robbins, James Watson.....Bellevue, '80.....Naugatuck.
 Roberts, Albert Joseph.....Harvard, '02.....Bridgeport.
 Roberts, Edward Kilbourne, Ph.B.,
 Yalc, '78.....Yale, '80.....New Haven.
 Robinson, Joseph.....P. & S., N. Y., '98.....West Cornwall.
 Robinson, Myron Potter.....Yale, '95.....Windsor Locks.
 Robinson, Myron Winslow.....Berkshire, '60.....Noroton.
 Robinson, Paul Skiff, Ph.B., Yale, '89.....Yale, '91.....New Haven.
 Robinson, Rienzi.....L. I. Hosp. Coll., '69.....Danielson.
 Rock, Emilien.....Victoria, '89.....North Grosvenordale.
 Rockwell, Thomas Francis.....Univ. N. Y., '81.....Rockville.
 Rodman, Charles Shepard.....P. & S., N. Y., '68.....Waterbury.
 Rogers, Frederick.....Univ. N. Y., '63.....Willimantic.
 Rogers, Henry Alexander.....Bellevue, '86.....New London.
 Rogers, Thomas Weaver.....P. & S., N. Y., '90.....New London.
 Ronayne, Frank Joseph.....Yalc, '04.....Hartford.
 Root, Edward King.....Univ. N. Y., '79.....Hartford.
 Root, Joseph Edward, B.S., Boston
 Univ., '76.....P. & S., N. Y., '83.....Hartford.
 Rose, John Henry.....Univ. N. Y., '92.....Hartford.
 Rowland, Edward Gould, B.A., Oberlin, '99..Balt. Med. Coll., '03.....Saybrook.
 Rowley, Alfred Merriman.....Univ. Vt., '97.....New Haven.
 Rowley, Robert Lee.....Yalc, '03.....Hartford.
 Ruickoldt, Arthur.....Univ. Vt., '97.....Westport.
 Rundlett, David Livingstone.....P. & S., N. Y., '89.....New Haven.
 Russell, George Washington.....Bellevue, '96.....Waterbury.
 Russell, Gurdon Wadsworth, Trinity,
 B.A., '34; M.A., '37.....Yalc, '37.....Hartford.
 Russell, Thomas Hubbard, Ph.B., Yale, '72..Yalc, '75.....New Haven.
 Russell, William Spencer.....Yale, '80.....Wallingford.
 Ryan, Joseph Patrick.....P. & S., N. Y., '03.....Hartford.
 Ryan, Patrick Joseph.....Niagara, '98.....Hartford.
 Ryan, Timothy Mayher, A.B., Loyola Coll. Balt. Med., '02.....Torrington.
 Ryle, John Joseph, A.B. and B.S.,
 Villanova, '94.....Univ. Buffalo, '97.....Stamford.
 Sanford, Leonard Luther, B.A., Yale, '90..Yalc, '93.....New Haven.
 Sanford, Ward Harding.....Balt. Med. Coll., '95.....New Haven.

Saunders, Norman Brown.....	P. & S., N. Y., '00.....	Winsted.
Schavoir, Frederick.....	P. & S., Balt., '87.....	Stamford.
Schulz, Herman Samuel.....	Hahnmann, '01 (Phil.)....	Bridgeport.
Scoville, Clarence Henry.....	Balt. Med. Coll., '92.....	New Canaan.
Sears, Cushman Allen.....	Univ. N. Y., '62.....	Portland.
Seaver, Jay Webber, B.A., Yale, '80; M.A., '93.....	Yale, '85.....	New Haven.
Sedgwick, James Theodore.....	Univ. N. Y., '85.....	Litchfield.
Sedgwick, Otis White.....	Univ. Vt., '04.....	Brookfield.
Segur, Gideon Cross.....	P. & S., N. Y., '82.....	Hartford.
Selleck, Nathaniel.....	Univ. N. Y., '89.....	Danbury.
Sellew, Philip Hamilton.....	Jefferson, '90.....	Salisbury.
Shanan, Denis Joseph.....	Univ. Vt., '85.....	Norwich.
Shannon, James Bernard.....	Victoria, '89.....	Danielson.
Sheedy, George Francis, Ph.B., Yale, '99..	Yale, '02.....	Bridgeport.
Sheehan, William Joseph, B.S., Manhattan Coll., '92.....	Yale, '95.....	New Haven.
Shelton, Gould Abijah, M.A., Yale, '91.....	Yale, '69.....	Shelton.
Shepard, Durell.....	Yale, '64.....	West Haven.
Shepard, John McIntosh.....	Univ. N. Y., '90.....	Madison.
Sherer, Henry Clifford.....	Univ. N. Y., '92.....	South Norwalk.
Sherrill, George.....	P. & S., '91.....	Stamford.
Simmons, Willard Nelson.....	Univ. Vt., '89.....	Tolland.
Simonds, Clarence Eugene.....	Univ. N. Y., '97.....	Willimantic.
Simpson, Frederick Thomas, B.A., Yale, '79..	Me. Med. Coll., '84.....	Hartford.
Skiff, Francis Sands.....	Univ. N. Y., '88.....	Falls Village.
Skinner, Clarence Edward, LL.D., Rutherford, N. C., '00.....	Yale, '91.....	New Haven.
Slattery, Morris Dove.....	Yale, '93.....	New Haven.
Sleeper, George Everest.....	Dartmouth, '95.....	Hartford.
Sloan, Thomas George.....	P. & S., N. Y., '99.....	East Manchester.
Smirnow, Louis Mair.....	Yale, '95.....	Bridgeport.
Smith, Andrew Jackson.....	P. & S., N. Y., '63.....	Bridgeport.
Smith, Charles.....	L. I. Hosp. Coll., '90.....	Riverside.
Smith, Earl Terry.....	Yale, '97.....	Hartford.
Smith, Edward Dorland, A.B., Yale, '96.....	Yale, '99.....	Bridgeport.
Smith, Edwards Montrose.....	P. & S., N. Y., '82.....	Bridgeport.
Smith, Edward Weir, A.B., Yale, '78.....	McGill, Mont., '82.....	Meriden.
Smith, Egbert Livingston.....	Yale, '96.....	Waterbury.
Smith, Ernest Herman, A.B. Amherst, '85..	P. & S., N. Y., '89.....	Redding.
Smith, Frank Lewis.....	Univ. N. Y., '75.....	Stafford Springs.
Smith, Frank Llewellyn.....	Albany, '83.....	Bridgeport.
Smith, Frederick Sumner, B.A., Yale, '79..	Yale, '82.....	Chester.
Smith, Herbert Eugene, Ph.B., Yale, '79..	Univ. Pa., '82.....	New Haven.
Smith, Henry Hubert.....	Jefferson, '77.....	New Haven.
Smith, Newton Phineas.....	P. & S., N. Y., '82.....	Norwich.
Smith, Oliver Cotton.....	L. I. Hosp. Coll., '83.....	Hartford.
Smyth, Herbert Edmund.....	McGill Univ., '84.....	Bridgeport.
Spencer, Elizabeth Conover.....	Wom. Med. Coll., Pa., '03..	Waterbury.
Sperry, Frederick Noyes.....	Yale, '94.....	New Haven.
Spier, Seymour Leopold.....	Yale, '04.....	New Haven.
Sprenger, William.....	Univ. Vt., '91.....	New Haven.
Standish, Frank Billings.....	Yale, '03.....	New Haven.
Standish, James Herbert.....	Univ. N. Y., '95.....	Hartford.
Stanley, Charles Everett.....	Univ. Pa., '76.....	Middletown.

- Stanton, George Dallas.....Bellevue, '65.....Stonington.
 Stanton, John Gilman, B.A., Amherst, '70..Wurtzburg, '73.....New London.
 Stanton, Thomas Francis.....P. & S., Balt., '96.....Bridgeport.
 Starr, Robert Lytton, B.A., Trinity, '97;
 M.A., '00.....P. & S., N. Y., '01.....Hartford.
 Staub, George Edwards.....L. I. Hosp. Coll., '93....New Milford.
 Staub, John Howard.....L. I. Hosp. Coll., '99.....Stamford.
 Steadman, Willard George.....Bellevue, '74.....Southington.
 Steele, Henry Merriman, Ph.B., Yale, '94..Johns Hopkins, '02.....New Haven.
 Steiner, Walter Ralph, A.B., Yale, '92;
 M.A., Yale, '95.....Johns Hopkins, '98.....Hartford.
 Stern, Charles Seymour, A.B., C. C., N. Y....Bellevue, '91.....Hartford.
 Stetson, James Ebenezer.....Yale, '81.....New Haven.
 Stevens, Frank William.....Yale, '00.....Bridgeport.
 Stevens, Howard Granson.....Balt. Med. Coll., '04.....Cornwall.
 St. John, Samuel Benedict, B.A., Yale, '66..P. & S., N. Y., '75.....Hartford.
 Stockwell, William Myron.....Univ. Pa., '04.....Suffield.
 Stoll, Henry Farnum.....P. & S., N. Y., '02.....Hartford.
 Stone, Jay Stephen.....P. & S., N. Y., '65.....New Britain.
 Storrs, Eekley Raynor.....Jefferson, '90.....Hartford.
 Stoughton, Arthur Volney, B.A.,
 Pomona, Calif.....Univ. Ohio, '98.....Terryville.
 Stratton, Edward Augustus.....Univ. N. Y., '83.....Danbury.
 Street, George.....Yale, '01.....Torrington.
 Street, Philo William.....Univ. Vt., '92.....Suffield.
 Stretch, James.....Univ. Coll., Richmond, Va., '02, Stafford Springs.
 Strosser, Herman.....Univ. Berlin, '84.....New Britain.
 Sullivan, Daniel.....Univ. N. Y., '97.....New London.
 Sullivan, Daniel Francis, A.B., Niagara
 Univ., '89.....Niagara Univ., '91.....Hartford.
 Sullivan, James Lawrence.....P. & S., Balt., '01.....Bridgeport.
 Sullivan, John Francis, B.A., Yale, '90....P. & S., N. Y., '94.....New Haven.
 Sullivan, Michael Joseph.....Cornell, '00.....Meriden.
 Sunderland, Paul Ulysses.....N. Y. Hom. Med., '94.....Danbury.
 Swain, Henry Lawrence.....Yale, '84.....New Haven.
 Swan, Horace Cheney.....Tufts, '03.....Hartford.
 Swasey, Erastus Perry.....P. & S., N. Y., '69.....New Britain.
 Swenson, Andrew Clay.....Yale, '02.....Waterbury.
 Swett, Josiah.....Univ. Vt., '78.....New Hartford.
 Swett, Paul Plummer.....Univ. N. Y., '04.....Hartford.
 Taft, Charles Ezra.....Harvard, '86.....Hartford.
 Tanner, Alfred Herbert.....Bellevue, '74.....Brooklyn.
 Taylor, John Clifton.....Univ. Mich., '91.....New London.
 Taylor, Maude Winifred.....Tufts, '05.....Hartford.
 Teele, Julia Ernestine, A.B., Tabor, '85....Wom. Med. Coll., Pa., '88, New Haven.
 Tenney, Arthur John, Ph.B., Yale, '77....Yale, '83.....Branford.
 Thibault, Louis Joseph.....Yale, '00.....Waterbury.
 Thompson, Emma Jane.....Wom. Med. Coll., N. Y. Inf., '96, Hartford.
 Thompson, George.....Me. Med. Coll., '89.....Taftville.
 Thompson, Harriet Adaline.....Wom. Med. Coll., Pa., '93, Bridgeport.
 Thompson, Lloyd Orrin.....Dartmouth, '92.....Greenwich.
 Thompson, Whitefield Nelson.....Jefferson, '89.....Hartford.
 Tiffany, Frank Monroe, A.B., Amherst, '91..Univ. Pa., '96.....Stamford.
 Tingley, Witter Kinney.....Bellevue, '86.....Norwich.

- Tinker, William Richard.....Univ. N. Y., '80.....South Manchester.
 Topping, Jacob Reed.....Univ. N. Y., '82.....Bridgeport.
 Townsend, Charles Rodman.....Albany, '95.....Bridgeport.
 Townsend, Jos. Hendley, B.A., Yale, '85...Yale, '87.....New Haven.
 Tracey, William Joseph.....Univ. N. Y., '89.....Norwalk.
 Travis, Catherine Hutchison.....Johns Hopkins, '03.....New Britain.
 Treadway, William Buckingham.....Univ. Mich., '83.....Stamford.
 Trecartin, David Munson.....Dartmouth, '94.....Bridgeport.
 Tuch, MorrisBellevue, '06.....Hartford.
 Tudor, Mary Starr.....Wom. Med. Coll., Pa., '93, South Windsor.
 Tukey, Frank Martin, B.A., Bowdoin, '91..Harvard, '94.....Bridgeport.
 Turbert, Edward Joseph.....Balt. Med. Coll., '04.....Hartford.
 Turner, Arthur Robert, A.B., Amherst, '84..Univ. Paris, '94.....Norwalk.
 Tuttle, Charles Alling, Ph.B., Yale, '88...Yale, '90.....New Haven.
 Tyler, Heman Augustin, Jr.....Yale, '98.....Hartford.

 Vail, George Francis, B.S., Villanova, '98..Univ. Pa., '02.....Hartford.
 VanStrander, William Harold.....Univ. Vt., '00.....Hartford.
 Van Vleet, Peter P.....Bellevue, '69.....Stamford.
 Varnell, Arthur.....Bowdoin, '94.....Waterbury.
 Varno, Henry George.....P. & S., Balt., '82.....Thompsonville.
 Verdi, William Francis.....Yale, '94.....New Haven.
 VonTobel, Albert Eugene, B.A., Yale, '96..Yale, '99.....Meriden.

 Wadhams, Sanford Hosea.....Yale, '96.....Torrington.
 Wadhams, Noah Samuel, Ph.B., Yale, '97..Yale, '00.....Goshen.
 Waite, Frank Louis.....Bellevue, '88.....Hartford.
 Walsh, Frederick William.....P. & S., Balt., '85.....Rockville.
 Walsh, Thomas Patrick.....Univ. Vt., '02.....Middletown.
 Ward, James Ward.....P. & S., Balt., '95.....Hartford.
 Warner, Charles Norton.....Jefferson, '96.....Litchfield.
 Warner, George Howell.....Yale, '97.....Bridgeport.
 Wason, David Boughton.....P. & S., N. Y., '00.....Bridgeport.
 Waterhouse, Henry Edwin.....P. & S., N. Y., '02.....Bridgeport.
 Waters, John Bradford.....Univ. Vt., '90.....Hartford.
 Watson, William Clark.....L. I. Hosp. Coll., '97.....Bridgeport.
 Watson, William Scymour.....L. I. Hosp. Coll., '87.....Danbury.
 Weidner, Calvin.....Univ. Ind., '93.....Manchester.
 Weir, Janet Marshall.....Queen's Univ., Kingston, Ont., '91, Hartford.
 Welch, Edward Hubbard.....Yale, '76.....West Winsted.
 Welch, George Kellogg.....P. & S., N. Y., '78.....Hartford.
 Welch, Harry Little, A.B., Yale, '94.....Yale, '97.....New Haven.
 Welch, Thomas Francis.....Georgetown, '04.....Hartford.
 Welch, William Collins.....Yale, '77.....New Haven.
 Weldon, John.....Univ. N. Y., '83.....Willimantic.
 Weldon, Thomas Henry.....Univ. N. Y., '83.....South Manchester.
 Wellington, William Winthrop.....Univ. Vt., '89.....Terryville.
 Wells, Ernest Alden, A.B., Yale, '97.....Johns Hopkins, '01.....Hartford.
 Wersebe, Frederic William.....Univ. N. Y., '98.....Washington.
 West, Redfield B.....Univ. N. Y., '79.....Guilford.
 Whcatley, Louis Frederick.....Tufts, '03.....Meriden.
 Wheeler, Frank Henry, B.A., Yale, '80...Yale, '82.....New Haven.
 Wheeler, Lewis Hawley.....Yale, '97.....Westport.
 White, Benjamin Walker.....L. I. Hosp. Coll., '86.....Bridgeport.
 White, Robert Creighton.....Univ. Vt., '89.....Willimantic.
 Whiton, Francis Henry.....Dartmouth, '72.....Manchester.

Whittemore, Edw. Lancaster, Ph.B.,

Yale, '92.....Univ. Va., '94.....New Britain.

Whittemore, Edward Reed, A.B., Yale, '98..P. & S., N. Y., '02.....New Haven.

Whittemore, Frank Hamilton.....Bellevue, '74.....New Haven.

Wiedman, Otto George.....Univ. Pa., '05.....Hartford.

Wight, George DeWitt.....Bellevue, '87.....Bethel.

Willard, Frederick Buell, A.B., Univ.

Vt., '97.....Univ. Vt., '00.....Hartford.

Williams, Allen Hamilton, A.B.,

Harvard, '91.....Harvard, '01.....Hartford.

Williams, Marian Walker, A.B.,

Radeliffe, '97.....Johns Hopkins, '01.....Hartford.

Wilmot, Louis Howard.....Univ. N. Y., '91.....Ansonia.

Wilson, Frederick Morse, A.B., Colby, '71..Harvard, '75.....Bridgeport.

Wilson, James Francis.....Univ. Vt., '04.....Hartford.

Wilson, William Patrick.....P. & S., Balt., '90.....Wallingford.

Winchell, Alverd Ezra, A.B., Wesleyan, '57..P. & S., N. Y., '65.....New Haven.

Winship, Ernest Oliver.....Univ. Vt., '00.....Rockville.

Witter, Orrin Russell.....P. & S., N. Y., '01.....Hartford.

Witter, William.....Yale, '65.....Norwich.

Wolff, Arthur Jacob.....Tex. Med. Coll., '76, Bellevue, '83, Hartford.

Wooster, Charles Morris.....Univ. N. Y., '79.....Tarrifville.

Wordin, Nathaniel Eugene, B.A., Yale,

'70; M.A., Yale, '72.....Jefferson, '73.....Bridgeport.

Wright, Frank Walden.....Bellevue, '80.....New Haven.

Wright, George Herman.....P. & S., N. Y., '94.....New Milford.

Wright, John Winthrop, A.B., Amherst, '77..Univ. N. Y., '80.....Bridgeport.

Wright, Theodore Goodelle.....Univ. N. Y., '65.....New Britain.

Wurtenberg, William Charles, Ph.B.,

Yale, '89.....Yale, '93.....New Haven.

Young, Charles Bellamy.....P. & S., N. Y., '94.....Middletown.

Members noticing any errors or omissions in any part of this record will please inform the Secretary for correction in future lists.



